



House of Commons  
Science and Technology  
Committee

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# The Use of Science in UK International Development Policy

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*Oral and written evidence*

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## The Science and Technology Committee

The Science and Technology Committee is appointed by the House of Commons to examine the expenditure, administration, and policy of the Office of Science and Technology and its associated public bodies.

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# Oral evidence

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## Taken before the Science and Technology Committee

on Monday 12 January 2004

Members present:

Dr Ian Gibson, in the Chair

Paul Farrelly

Dr Evan Harris

*Witnesses:* **Mr Paul Spray**, Head, Central Research Department, **Mr Julian Lob-Levyt**, Chief Human Development Adviser, and **Mr Jim Harvey**, Head of Rural Livelihoods, Department for International Development, examined.

**Q1 Chairman:** Can I, first of all, welcome you here and thank you for taking the time to come and help us kick off this inquiry. Let me apologise for the absence of Members of the Committee who find that the debate on housing is something to which they want to contribute, and I think I understand that, but we are quorate and hopefully we can be as effective as a Committee of eleven. I will start by asking you about the broad scope of international development and the role of science and technology in developing this policy. I think there was a paper in 1997 on eliminating worldwide poverty, so the soft question is what role the science and technology plays. Is it a key role, or are we just playing at it, or what?

**Mr Spray:** Thank you. I am head of research in our central research department, all research having been pulled together, and my colleagues are Julian Lob-Levyt, who is the Chief Human Development Adviser, and Jim Harvey, who knows all there is to know about agriculture. In the 1997 White Paper that you referred to there is a statement about “Knowledge, research and technology underpin all our work. The elimination of poverty and the protection of the environment requires improved access to knowledge and technologies by poor people.” So we do recognise right at the beginning the necessity for science and technology and the importance of poor people having access to it, and our function is to try and facilitate that access and to allow the development of new science and technology, and I think policies in DFID are influenced by science and by presentations by chief advisers, as our scientists are called.

**Q2 Chairman:** Where does social science fit into all this? Does it have a different dimension in your thinking from natural sciences? I am not sure they should not be together, but that may be too philosophical. Do you make a difference between them? Do you differentiate in any way? I guess social science has some evidence attached to it somewhere.

**Mr Spray:** I am a social scientist—

**Q3 Chairman:** I know you are!

**Mr Spray:** So you would expect me to say that social science does, indeed, have some evidence attached to it! We treat all the sciences, social or otherwise, in the

same way. We have five chief advisers—some are social scientists, some are natural scientists—and the thinking of all of them feeds into our discussions in exactly the same way. There are social scientists and other scientists in our country offices: there are social scientists and other scientists in our policy division teams. We have been trying more recently to pull them together so they are not operating separately but each is informing the other, without trying to say, “Get rid of your discipline”. One of the things we are quite clear about is the need to keep disciplines seriously professionally skilled.

**Q4 Chairman:** In your interactive work between the different groupings in the department, what kind of compromises do you have to make in terms of long term and short term research goals, for example?

**Mr Spray:** The main criteria always is the impact on poverty. Sometimes that will be very long term and sometimes you can see something very quick. The bit I work on is research: research we define as something that tends to be long term, five years or more. On the question of allocating money we have to try and ask ourselves “Which of these has the most plausible impact on poverty?”, and whether it has the impact on poverty next year or in five years’ time does not matter so much as the size of the impact. So for that sort of calculation an economist is sometimes quite useful but it is people like my colleagues who are going to give the potential strategies to be able to see what you can compare.

**Q5 Chairman:** Do you make estimates about where there are going to be these big poverty issues coming up in the future? Give me an example of some of your work, perhaps, that you have carried out in this area. In relation to climate change and so on there is obviously going to be flooding and problems related to that and a lot of people ask scientists to give them information. How do you take that information and do something with it—that the weather is going to change dramatically in 10 or 15 years? How do you handle that?

**Mr Spray:** On something like climate change we would look to a whole variety of people, certainly to people like agriculturalists on the potential for agriculture change and climate, and we might want to say something about that in terms of crops, but we

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would also be looking to social scientists concerning people's coping strategies and how people have managed in the past if, for example, water levels rise; we would look to engineers on issues of water moving around and so on, but then it moves out in a whole number of different areas, even to areas of governance and so on and what might happen even in terms of political structures in places which are badly affected.

**Q6 Chairman:** Do you say to people, "Don't build houses there; don't plant crops there"?

**Mr Harvey:** No. Behind this debate I would ask you to make a slight distinction between more upstream strategic research and research which is going to deliver more immediate benefits, the presumption being that the latter is more short term than the former. Firstly I would like to mention a caveat which is not answering the question directly which is that our Renewable Natural Resources Research strategy is nearly at the end of a 10 year period, so we think that is quite a long term horizon. Within that there are individual shorter term pieces of research, but our research managers have put this together to build up the strategic picture over time, so the delivery period we are thinking of there is about 10 years. In terms of more futuristic pieces of thinking, the current structure of Policy Division—and I do not know whether you are aware of that structure and we can give you some background on that—is that part of the rationale allows us the scope for more futures type thinking, whether it be through scenario planning or other techniques and that process has started from 1 April last year with the new structure, so the intention there is to do more thinking ahead and to feed that<sup>1</sup>. Paul's Central Research Department is part of that same division, and there is a process of dialogue going on now where the new policy teams are identifying more and more the longer term picture and then feeding that into the next generation of research.

**Q7 Chairman:** So in relation to that, then, do you think we know all we need to know about the science and technology? It is all out there, done, published and so on, and you just have to put that into practice and into the social dimension?

**Mr Spray:** Not at all, and if we gave you that impression I must apologise. Not remotely. We can take another example, the example of HIV/AIDS and the vaccine initiative or, indeed, other works.

**Mr Lob-Levyt:** In some areas the importance of getting the result is going to depend on some very clever science to get there, and we just do not know the answers. One of those is the vaccine against HIV/AIDS, so we are quite prepared as part of the international public/private partnership, IAVI, to put long term financing into something because it is so important to the development agenda but there is no solution, or we can put choices into funding looking at existing research and what has been done in a particular area. One of the examples we provided was through the Cochrane collaboration

which trawls through the literature and says what is happening in a particular area of treatment and what works and what does not according to existing evidence, which can return quite dramatic benefits in terms of evidence-based policy in a shorter timescale. We are quite prepared to invest long term in hard science when we know the evidence is there, but the potential gain when we get there is so enormous that we feel no one is going to go down that road.

**Q8 Chairman:** In relation to this decision-making process, how many of your staff are natural scientists? How does it break down in terms of career paths? Do you feel well-served by the information you get in science and technology? Are these honours graduates flooding to get jobs in DFID? Can you give us a rough breakdown?

**Mr Lob-Levyt:** We cannot on honours graduates, but our advisory groups—

**Q9 Chairman:** In science and technology?

**Mr Lob-Levyt:** In science and technology we could perhaps provide you with that information later.

**Mr Spray:** We gave you the information we could most easily extract in paragraph 30 of the evidence where we have not distinguished between natural science and social science. Perhaps wrongly we interpret science as covering the range. You will see there, for example, that there are 66 Health and Population advisers and there are 62 people we call "Rural Livelihoods" advisers many of whom would have a science background in agriculture or related topics. There are 46 people there under "Infrastructure and Urban", of whom 22 are working as engineers as opposed to seconded elsewhere, and so on. That is our complete range of professionally qualified staff.

**Q10 Chairman:** So is there a balance that you are trying to set up there in terms of your policies, natural science and social changes and so on? Do you try to recruit into that arena? Do you make decisions in that arena and build the staff in accordingly, or are you stuck with what you have?

**Mr Spray:** No, the staffing has changed. We have increased the number of social scientists faster than the number of natural scientists recently, and that was a need that was identified a while ago.

**Q11 Chairman:** Who identified that need? Where did that change come from?

**Mr Spray:** It was before my time but the way it would normally work is that it would precisely have been chief advisers identifying a need for increased staff and identifying a greater demand from the programme managers in the field for staff falling on them.

**Q12 Chairman:** How does it work? I am fascinated.

**Mr Lob-Levyt:** In the health and population groups, for example, for which I am responsible, the majority of our staff work at the country level in the country offices, so the heads of the country offices look for the skills that they need to deliver against

<sup>1</sup> Note by the witness: Into DFID's thinking and policy.

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their programmes, and our responsibility is to furnish them with the people with those skills. Similarly at the centre, with the new policy teams we have at the centre, they are looking for a range of skills and we provide them with advisers with those kinds of skills.

**Q13 Chairman:** Do you ever have flaming arguments with them about their judgment as against yours, and seeing the whole picture?

**Mr Lob-Levyt:** Our responsibility as chief advisers is to look at the overall balance of our professional groups and see if we have the right skills, so I would be concerned in that group if I did not have people with particular scientific skills in research amongst that group. We do have to balance that against the overall priorities, of course.

**Q14 Chairman:** In terms of millennium development goals you are going to try and deliver something by 2015. It is going to be a key year in British history, a year when everything is going to happen with nuclear energy and so on. What is your thinking behind that? Is that part of a long term strategy? It is 10 years.

**Mr Spray:** The millennium development goals were developed in an international process in a series of UN conferences and finally approved in the Millennium Summit of the United Nations, so they are something set internationally, and it has been a very big effort of DFID since 1997 to have millennium development goals treated as targets for the whole world. So we are very committed to those and we have worked very hard in international fora in the World Bank and so on, to get the millennium development goals accepted, so they are very much the goals against which all our programmes are judged.

**Q15 Dr Harris:** On the particular question of the amount of scientific advice you have within the department, do you have any information about how you rate, highly or in terms of spend, compared to other international development departments of other comparable countries, or, indeed, western European countries or Scandinavian countries? Historically, have you had a greater spend on science as a proportion of your budget than Scandinavian countries? Do you have anything on that? You would want to benchmark against something, I would have thought.

**Mr Spray:** Yes. The problem is definitions. The research review which was done for DFID in 2002 made an attempt to do some comparisons across this for total research spend, and simply could come up with little better than to say that we were one of the leaders. So we feel fairly confident that we are one of the leaders but it has proved difficult to benchmark. One of the things we very much want to do in research over the next year or so is not only more international collaboration but do a lot more international benchmarking, particularly horizon scanning and identifying what the key issues are and where the gaps emerge. It is very difficult to find out at the moment long term funding gaps for the future.

It is easier to find in some disciplines—there are health consultations and there are consultative groups on international agricultural research—but if you are trying to look right across the broad field it is surprisingly difficult, and we have been talking to some of our international partners about trying to do more work on that.

**Q16 Dr Harris:** If you do find there is information that you have available I would be interested to see it.

**Mr Spray:** Certainly, yes.

**Q17 Dr Harris:** We have had evidence, as you might expect that is not necessarily all complimentary, and Prospect, the union, has given us a statement saying the Department's "ability to formulate policy on the basis of scientific evidence is being steadily eroded by changes in the department's organisational structure", and I think they are talking about a decline in the amount of expertise, as we have just been talking about in the Chair's question. Would you accept that?

**Mr Spray:** No. We can look at it in a number of different ways, but the absolute number of professionally qualified staff has been going up, and it is true that it has been going up faster in the social sciences than elsewhere. We have twice the number of economists than we had in 1993 but also we have significantly more agricultural specialists, and significantly more health and population advisers.

**Q18 Dr Harris:** As a proportion of your overall workload?

**Mr Spray:** Yes.

**Q19 Dr Harris:** Would it help if you doubled the work and increased by 10% the members of staff? I am sorry to interrupt but I think we ought to talk in proportions here unless people are getting twice as efficient.

**Mr Spray:** That is a fair point. I would still argue that our numbers are increasing. We have been trying to be more efficient in the way we spend our money so we are not chasing after a large number of small projects, and the shift in thinking about development policy to support government poverty reduction strategies has also meant a shift in the kind of intellectual resources, and what staff we need to do it. The aid programmes tend to come in larger lumps of money than before, so we can be a bit more efficient in the way we spend our money. So that would be one element. Secondly, we have just done a large re-organisation of the way we think about policy in putting in a new Policy Division. We have brought all our research together. One of the reasons for bringing all the research together was to avoid duplication and try to pick up bits of good practice that were happening in different parts of the research area and apply them across. The policy division reorganisation means that we are much better at working in a cross-disciplinary fashion than we used to be, so there has been a very serious effort in the last year to improve the quality of advice going to ministers and senior officials.

**Q20 Dr Harris:** One of the things I thought you might say in response to the question was that you are making more use of outside consultants. Can you say a word about that and how you ensure that you have the balance right? You are not overly dependent on outside resources so I guess you do not have immediately accessible sources of information. Do you have a strategy to drive up or down the number of consultants you use for this sort of work?

**Mr Lob-Levyt:** Of course we look to the outside and we look in different ways. We do use consultants. It is important to retain sufficient in-house expertise to make the best use of them, and I agree with you on that fully. That is important to us. We also work with international bodies to guide us on the best scientific advice. For example, in the health field we would look to the World Health Organisation, that we put substantial funding to, to give us state of the art advice in critical areas, whether it be HIV treatment or the management of malaria, and we would rely on those sorts of organisations to guide us in that international normative standard setting in research and in policy advice.

**Mr Spray:** In research generally we have done some work in the last year trying to benchmark ourselves against other government departments, and particularly other international organisations, and it does look as though we need more in-house staff, not in order to substitute for the external but precisely to engage better with them. So we are putting in plans to increase the number of professional staff. Within my department, for example, I think there is an increase from seven to about 17 over the next 18 months.

**Q21 Chairman:** Could you give us that in writing?

**Mr Spray:** Sure.

**Q22 Dr Harris:** If you are changing the way aid is delivered in terms of budgetary support and giving money en bloc to governments who have the capacity to use it on the ground in developing countries, then one might argue that one needs to ensure that they have the scientific capacity rather than it being present within the DFID in that country or centrally because you are not doing the implementation. Has that had an impact on your staffing and approach within the science and research department?

**Mr Spray:** It has not had a particular impact within research but I think in country programmes it would.

**Mr Harvey:** The way we would see it is that there are two ways of looking at this. One is about internal coherence purely within DFID making sure all these parts of the chain are in place; another is to say no, there is an international and a national framework out there, including development countries' capacity and our job is to make sure that bits of that science process are in place. We historically have done rather a lot of capacity building at country level through direct support to, for example, my area of national agricultural research organisations, and I think with a move towards budget support in some places there may have been a dip in our direct

support for capacity building. But part of the rationale for doing that and taking the budget support approach in country is to try and tackle once and for all the issue of getting developing country systems in order. So it is a matter of effectively routing resources through different routes, but it does not mean we lose track of the policy and the sectoral capacity issues that support that move, and the staffing in our offices reflects that. In the case of agricultural research it would be the rural livelihood adviser who looks after the research agenda, and those numbers are constant. We are still engaging with those issues.

**Mr Spray:** We tend now to move from discussing the particularities of particular projects more to discussing the broad policies, the sector wide policies and so on. So some of the educational capacity building that has gone on has not been so much support for an individual institution as discussions with governments about the nature of education financing and that kind of thing.

**Q23 Paul Farrelly:** Coming back to your research strategy and your priority, clearly those will change over time. When you were drawing up your new strategy, can you tell us what the main themes were that came out of that review and the priorities you are likely to adopt? How you have chosen them and how you have gone about deciding the timescale that these priorities will cover?

**Mr Spray:** As you rightly say, we have yet to produce a research strategy, and it will be for ministers to decide what it is. I can discuss the kind of issues that we are dealing with and the kind of approach we are talking but obviously the final decision will depend on the Secretary of State. We have picked up the idea of promoting the production and uptake of technologies and policies that will contribute to the millennium development goals, so both the production of new science and technology and the uptake are really important to us. That seemed to encapsulate it. In looking at what we should do the two main criteria are the potential impact on millennium development goals, and you have to think about the risk as well and whether it is high impact, high risk, and, secondly, the need for DFID funding as opposed to other funders in the international spectrum. Are there other funders already funding this area, or is there a way, for example, in which the DFID joining this particular effort might greatly increase funding in that area which we see to be important? So there are those two criteria—the impact on poverty and DFID's funding niche. I cannot say, obviously, what the decisions will be but the kind of issues we have been looking at are to do with the need for agricultural technologies and, again, there seems to be high potential for agricultural technologies perhaps with public/private partnerships, but not just those; the need for health technologies, the possibility of an HIV/AIDS vaccine has already been mentioned; there are clearly very important areas to do with environmental sustainability and policies on environmental sustainability to do not only with climate change but wider than that; and policies on

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service delivery. It is all very well to have vaccines but unless there are ways in which they can be delivered in the field it would be difficult, so research in that area seems to make sense. Also, economic developments certainly for improving the incomes of the poor. Then there is a broader area about understanding processes of social and economic change and what processes are going on anyway, climate change you can see is a natural process, but there are also social processes like urbanisation which we need to understand and governments need to understand if they are to be able to achieve the millennium development goal. So there is an area there where we think research is important. These are obviously fairly high level, and what we are hoping to do is get some approval for rough balances at this high level and then at the beginning of next year we will be doing more scoping work, picking up on quite extensive consultation we have done in the year behind us to enable us to define the issues more closely.

**Q24 Paul Farrelly:** In this respect, which do you think are DFID's key areas where it can "add value", to use a much abused phrase, where you are complementary to the work of other people? Where it is not just "me too" work but work where you can make a real difference in the focus you have? What is your edge?

**Mr Spray:** We have spent quite a lot of time thinking about that. There are obviously areas where the United Kingdom is strong where we therefore have good contacts and that kind of thing. For example, again, in the area I know about, social science analysis, there are particular ways of approaching the analysis of politics that the United Kingdom has strengths in which we could draw on. But when we are looking at DFID's advantage, because we have untied aid, we can draw on anything around the world. It comes down much more to looking at what the initiatives are that are under way already and what are the potential initiatives that could be got going that might make a real difference. I have given you the headline areas. But say if you are looking at health technologies and you are thinking about malaria being a very big killer, then you can think of what the chances of initiatives are in this area, what the private sector can be doing and what the public sector can be doing, and areas emerge.

**Q25 Paul Farrelly:** Will it be apparent in this respect when your strategy is agreed that you have not just been thinking about this but that, when it is translated into reality, you have an edge?

**Mr Lob-Levyt:** There are two dimensions too. One is where we think we have some comparative advantage, and the United Kingdom expertise informs that. Certainly in my area, health and education, we believe we have expertise in how services operate and are financed and the way the systems work, and that is an area we have heavily invested in because it had been under-invested in. One of the areas we should be reasonably proud of is that we build capacity internationally and in developing countries in these areas. We are also

increasingly looking at how priorities are set by developing countries themselves, exploring where they see priorities and where they see the gaps in which we ought to be financing. So it is less that our own opinion is being forced upon developing countries, and more that developing countries are having a louder and perhaps more informed voice.

**Q26 Paul Farrelly:** How do you think the new strategy is likely to affect the balance of your research spending in the future? Significantly or not very much at all?

**Mr Spray:** That is entirely a matter for the Secretary of State to decide upon, and I think you may be taking evidence from him so we will have to see.

**Q27 Chairman:** What advice would you give him, then? I am not letting you off that easily!

**Mr Spray:** I tried in my previous answer to indicate the areas where we think there is a real opportunity to do substantial work, and the balance between these is essentially a political decision. We are offering to the Secretary of State a set of areas, and in the end it is a political decision.

**Q28 Chairman:** Are those areas you have already mentioned? Malaria and so on?

**Mr Spray:** Yes.

**Q29 Paul Farrelly:** Have you been notified, or do you expect, that the balance of your research spending in the future or its focus or your budget in the future is going to be affected by the reconstruction of a certain Middle East country?

**Mr Spray:** We have no reason to believe it will be.

**Chairman:** Do you know which country?

**Q30 Dr Harris:** I hope it is not Iran! I want to ask you a series of questions around capacity building, a subject you would have foreseen coming, I imagine. Can you give a preliminary statement as to how you see policy changing towards capacity building of research and the science base in developing countries? I think it is widely recognised that it is poor and not getting better very quickly because it is a long term investment and for various reasons, understandably, developing countries have more short term aims than, certainly, governments.

**Mr Spray:** The first thing to say is that the picture is not quite as bleak as that paints it. Particularly in India and China the science base may be patchy but there is some very high quality science going on. That is, after all, where a large proportion of the world's poor people live, so it is not quite as bad as that picture might suggest.

**Q31 Dr Harris:** What about sub Saharan Africa?

**Mr Spray:** Yes. In sub Saharan Africa there clearly is a very big problem. DFID's approach is decentralised to country offices. It is for the country offices to support the poverty reduction strategies that the government and the people of that country have adopted. Before I did this post I was in charge of the country office in Nigeria and one of the things we did at that point was put in place a seven year

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programme looking at health systems, picking up the point Julian was making. The very first thing we did there was to pay for a resource centre which built on particularly South African and Zimbabwean expertise in the organisation of health systems which Nigerians were then going through and benefiting from. That was an initiative that was taken by the country office, drawing on the advice of the centre and then the centre's links with other developing countries.

**Q32 Dr Harris:** But that would be an exception because it has often been said in the past that it was not encouraged for resources to be spent in country on these sorts of things.

**Mr Spray:** Well, if it was said it was not true. If you think "What is DFID trying to do?", in some cases we are trying to transfer finance so governments can spend the money: in other cases we are trying to help governments to build their capacity so they can do things better, and you can put most of the things DFID is trying to do in one pocket or the other.

**Q33 Dr Harris:** So specifically a scientific or technological capacity?

**Mr Spray:** Yes. As Jim mentioned earlier, the poverty reduction strategy approach implies that governments make their own poverty reduction strategy and we then support the implementation of that poverty reduction strategy. We then have a difficulty in attributing how much of our money goes to capacity building in those areas, because the government will spend its budget on whatever the government spends its budget on within that poverty reduction strategy. We are then more in a series of discussions with government, on particular sectors or whatever, about what might be done and what they are doing than funding individual projects in the way we perhaps used to do in the past. Within education, which you may be referring to, we have had a very strong focus on primary education because that was and is the big area where gains can be made, and the allocation of funding to primary education has been very low. So we have had a big emphasis in that area, and to some extent that has probably pulled us away from higher education support, and it may be that is the kind of thing you are thinking about.

**Q34 Dr Harris:** So given the problems you identify when you are giving funding to increase the budget and having to negotiate carefully how that is used, is there an argument for a separate strand—it may not be huge—specifically to build up some of the long-term science and technology and research capacities within these countries as a separate strand, and obviously in competition with others? Do you see there is an argument for that because otherwise it is not going to happen?

**Mr Harvey:** There is an argument for that but I think it is something that will come out in the wash because we are talking about a new type of dialogue at country level. The first round of PRSPs has been focused especially on health and education service

delivery, and the problem you are alluding to is that for many years the science establishments in many developing countries have been the Cinderella of their own ministries of agriculture and finance, so you find that, for example a Forestry Institute does not have its salaries paid and has been struggling for years to make its case. The thing about the PRS process is that for once we are trying to face these issues head on with governments, and it is a debate that is going to have to evolve over time. If it turns out after we have given these debates, say, two or three years, that countries say to us "Look, we just cannot fund this slightly long term work", then I imagine we should be considering whether it is necessary to go the route you are suggesting. The other point I would make is I do not think it is something for DFID alone. When the Consultative Group on International Agricultural Research had its AGM in Nairobi a few months ago we were talking about this with the World Bank and we recognised, particularly in sub Saharan Africa, that there is a capacity building issue in the system in agricultural research, and this is something which as a donor group we have suggested should be a priority for us to look at.

**Mr Spray:** What we would like as a central research team is link up more with country offices than in the past and maybe to link some of them up with each other to take forward capacity building both as part of the research programmes we are funding, but also independently.

**Mr Lob-Levyt:** Briefly commenting on this, the previous way we funded research through central type funding as opposed to bringing it together made it harder to join up with the country offices on capacity building, and one of the benefits of our new joined-up strategy is we can bring dialogue on research into our discussions through the poverty reduction process much more coherently than in the past.

**Q35 Dr Harris:** What is the role of DFID when it comes to looking at capacity building, let's say in health, in doing something about the drain of qualified trained health practitioners and, indeed, researchers from these countries to western countries including, apparently, an increasing number to our own country? Is there any research being done, and there probably is, on whether there is a net flow in, despite your efforts which must be frustrating for you, and are there policies being arranged to tackle this, for example, through reciprocal arrangements where we undertake to send our health care professionals out paid, one for one, for the ones we are sucking in.

**Mr Lob-Levyt:** There is cross Whitehall work at the moment looking at the movement of doctors and nurses in particular from the south to the north and to the United Kingdom. As you know, the Department of Health has issued some guidance to the NHS as to how it should be recruiting people and DFID was involved in developing that guidance.



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**Q36 Dr Harris:** I heard the Secretary of State announce that South African doctors were coming over to do some operations this country, and that this is a good thing.

**Mr Lob-Levyt:** With the exception of countries that we have bilateral agreements with, one of which is South Africa with whom we have just signed an agreement, where it is judged that they have reasonable supply of human resources, but that is a matter for the the Department of Health not DFID.

**Dr Harris:** And whose judgment is that?

**Q37 Chairman:** It is a political judgment, again.

**Mr Lob-Levyt:** Migration is a very difficult issue, of course. I have just come from a meeting in Geneva discussing this with ministers from Tanzania, Ghana, Uganda and elsewhere, and there are two sides to this. How do you manage your health service and provide the incentives, the salaries and the management structures, for the people to stay and who wish to stay, and how do we contribute to building better institutions where people wish to stay, because where people do wish to stay is not just a matter of salaries. On our side the policies we have in the north, Canada, Australia, New Zealand, the US and United Kingdom may be to recruit actively. We have to balance these demands against the human right of the free movement of labour. I have no simple answer to your question but it is a legitimate one and one we are very conscious of, and we are working through institutional capacity building to try and resolve it.

**Q38 Chairman:** You mentioned your links in scientific and technological matters with country offices and regional offices and so on. How would you describe that link? Is it strong, or just Christmas cards? Give us an example of where it really works well and how it works so that we have a concrete example.

**Mr Spray:** If I could say something on the research side, although it is not just research because the application of science and technology goes right across the policy spectrum. On the research side, on Friday I was having a video conference with DFID Tanzania with my people on agricultural research and their people on agricultural research, and we were talking about two agricultural research institutions, one of which is particularly important to the DFID Tanzania programme and one of which is important to our programmes. One we has a particularly good record of working with a good level of participatory research, and we were talking to DFID Tanzania about the potential of linking it up. They had a rural livelihood specialist at their end and we had one at our end. On a longer term basis, DFID Bolivia has developed a programme to support the new Bolivian agricultural research effort.

**Mr Harvey:** In general, I would say in the last five years the links have been getting stronger.

**Q39 Chairman:** In what way?

**Mr Harvey:** I will give an example, also in Africa. Each of these Regional Divisions have a regional policy department, and we have been working with the Africa Policy Department looking at the whole issue of agricultural research in Africa. They commissioned a study, in which they involved country programmes, to look at the state of agricultural research. The study was led by the Africa Policy Department with support from the centre. Now, I think that probably would not have happened a few years ago. We had more of a fragmented system 10 years ago in some respects, but these sort of things are happening now. We are discussing, for example, with the Africa division whether or not we should support the Africa Challenge Fund of the CGIAR.

**Q40 Chairman:** And the success story? I am happy that discussions are going on, but has there really been some strategic success?

**Mr Harvey:** It is early days yet because these discussions have been going on over the last 12–18 months in a more joined-up way.

**Mr Lob-Levyt:** We funded research in insecticide treated bed nets to prevent malaria, and worked closely with our country offices on both the studies that brought us the evidence for that—

**Q41 Chairman:** What does “worked closely with” mean?

**Mr Lob-Levyt:** We worked through a network of advisers working in country offices which I would meet on an annual basis collectively, where we would discuss different issues, and hear presentations on this kind of research, research we are funding or that is funded by others. We have regional meetings where we would meet with African advisers and discuss these issues, as a consequence we now fund substantive programmes for the roll out of bed nets in developing countries and, had we not been informed of that science and participated in it, we would not have been a major funder of those kinds of programmes.

**Q42 Paul Farrelly:** Could you clarify for me and the Committee the extent to which the new International Development Act requires you to go out and tender for contracts, and also just give us a flavour of the impacts that the untying of aid from research contracts has had on your work and on United Kingdom research capacity, particularly in your priority areas?

**Mr Spray:** The Act unties all aid and that includes research funding, so our research funding is untied and we cannot give a particular advantage to United Kingdom suppliers. The reason for that is to provide value for money for our objective for reducing world poverty. The evidence is that the United Kingdom can compete, and this should not come as a surprise because the United Kingdom research establishment is world class. In practice, some 90% of contracts for DFID advisory work went to United Kingdom suppliers in 2002–03. In the area I was working on we asked for five year, long term programmes for

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social science research last year, and that was open and anybody could apply, in the event, all the short-listed consortia were led by British institutions. Obviously it is true that less qualified British institutions might lose out more than if we did tie it, but our objective is to get the best quality. I do think you can look at it the other way round and see institutions that we have supported who are winning competitions worldwide. Julian mentioned one area in health systems research where some of the support we put in has enabled United Kingdom institutions to compete internationally and get more international money. The arrival of Gates money has meant that United Kingdom institutions have been able to win substantial contracts elsewhere.

**Q43 Paul Farrelly:** Can you let the Committee have some details of the figures to give some idea of the impact of the change in policy before and afterwards and as to the amount that has gone to British institutions and British institution-led groups?

*Mr Spray:* We certainly can.

**Q44 Paul Farrelly:** Does the policy put the United Kingdom at a disadvantage compared with other countries at all?

*Mr Spray:* I think only in the way I described. Obviously United Kingdom institutions that are not world class run the risk that they will not win our contracts.

**Q45 Paul Farrelly:** And do you have any intention on the flip side to spend more research money in developing countries, or do you not mind in that you just want the best people for the job?

*Mr Spray:* We do have a capacity building objective. When we say “the best people for the job”, there has been some research which we have funded which does indicate that you have more chance of uptake of your research if the researcher and the potential user of research are relatively close together. Very often this can be done in a collaborative kind of way so you have researchers in the country collaborating with institutions elsewhere, and that can be a very convenient way of getting very high quality research linked up with researchers in country. For that reason we would have a preference for getting involved in developing country research participation, but not that they would necessarily have to lead the whole thing.

**Q46 Paul Farrelly:** Are there any particular countries who are particularly pronounced in linking research aid to contracts for their own institutions?

*Mr Spray:* You mean other donor countries?

**Q47 Paul Farrelly:** Yes.

*Mr Spray:* Yes, I am sure there are.

**Q48 Paul Farrelly:** Who are the worst offenders?

*Mr Spray:* That I could not tell you.

**Q49 Chairman:** Who can tell us?

*Mr Spray:* I do not know.

**Q50 Chairman:** So there is nobody you know who can tell us?

*Mr Spray:* If you are asking which countries tie their research aid, that is something that can be found out, and quite a number of countries do favour their own institutions.

**Q51 Paul Farrelly:** Who should be particularly pushed to follow the United Kingdom example?

*Mr Spray:* I think that is a political question.

**Q52 Chairman:** And you are a civil servant and not political, I had forgotten that. Oh dear! So are United Kingdom institutions going to be chasing DFID money all the time? Is it going to be a hard job for them, whereas institutes in developing countries get on with it?

*Mr Spray:* I am not quite sure I see the point of the question. United Kingdom institutions I imagine will continue to apply for DFID money. We are very keen in research that they enter into consortia with developing country institutions when they do so and the experience recently, as I have said, is that those kind of consortia tend to win contracts.

**Q53 Chairman:** You mention in your report, too, your relationships with the Royal Society and the Natural History Museum and the World Bank and so on, and the phrase is closer collaboration would be “desirable”. What is the problem?

*Mr Spray:* I think in research we have simply had too few staff to do the kind of linking that would be desirable, and I hope with the new staff we are going to be getting we will be able to do that. We are particularly keen on links with research councils but also, as I mentioned earlier, with some of our international peers in funding.

**Q54 Chairman:** Is there going to be a cost disadvantage for United Kingdom people applying for grants in any way in research?

*Mr Spray:* There can be a cost disadvantage in that a United Kingdom institution which does not have any kind of subsidy from anybody else can be competing against an institution in Holland, for example, where their competitor may have core funding from the government. Under those circumstances the United Kingdom institution clearly is not playing on a level playing field. As far as we are concerned, we would try and take note of that; we would try to compare like with like and not disadvantage the United Kingdom institution. Obviously I cannot say whether other research donors elsewhere in the world would take the same attitude or not.

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**Q55 Chairman:** Have your colleagues picked up any disadvantage, in their experience?

**Mr Harvey:** This is a complaint we hear from the consulting industry, from the research community and lots of people. Perhaps the principal concern would be that, for example, if we put a significant amount of our funding through the international CGIAR system, more and more of that money is going to challenge programmes which are intended to bring about research coalitions and partnerships. Now, if some partners are coming into that effectively subsidised by their governments then, clearly, there is an issue for United Kingdom organisations who wish to participate, but I think this is something that is over and above DFID. It is a wider policy issue.

**Q56 Chairman:** As you know, British universities—and the debate on top-up fees is relevant to this at the minute—do not pay overheads for their research grants. Do you pay overheads on research grants in this country?

**Mr Spray:** In almost all cases, yes. We have been following government policy in this regard to try and make sure that—

**Q57 Chairman:** To make sure that the true cost of the research is funded?

**Mr Spray:** Yes. We may not have caught up in one or two older contracts where it was signed, but there is clear government policy in this regard.

**Q58 Chairman:** My last question concerns relationships with other government departments. You have talked about research councils. How would you describe your relationships with the Foreign Office and other departments who have scientific and technological interests? Do you talk to them or is it just Christmas cards?

**Mr Spray:** We have talked intensively in some areas, biodiversity and that kind of thing, where there are a whole number of inter ministerial bodies on which we are represented, and sometimes we take the lead and sometimes Defra does or whatever. But it has been patchy. Another area we have done a lot on is with the Treasury on macro economics and debt and that kind of area, but it has been patchy and I think the reason, again on the research side, has been shortage of staff on our side, and I very much hope we shall be able to do more.

**Q59 Chairman:** How will you go about that?

**Mr Spray:** One possibility is to set up something called the Funders' Forum, which is an idea we would be quite keen on. We would have to talk to the others to see if they are keen on it too. I understand some research councils do not regard it as a wonderful institution, but it sounds to us like a good place to start.

**Q60 Dr Harris:** I want to shift to the private sector. There are issues there, obviously, around patent protection and so forth. We are all aware of the arguments around on anti-HIV therapies. Without citing the example of IAVI, which I think has dealt with the issue quite clearly—it will not be subject to these problems although there are issues of manufacturing—in terms of future collaborations with the private sector, what steps are you taking, or are you advising should be taken in policy terms to avoid a repetition of the problem and the rows around this issue of the private sector feeling that they have something they need to maintain protection of in order to give them a return on the investment that they are putting in on their side?

**Mr Lob-Levyt:** I think the nature of the dialogue with the private sector has improved tremendously over time through the processes you have described and through others as well. Some of the agreements that have been made through the TRIPS negotiations have begun to be implemented. It has taken quite a lot of the heat out of this debate. My sense is that there is a much closer collaboration between the private and public sector than a few years ago.

**Q61 Dr Harris:** How do we avoid this problem because they have put investment in and they will want a return to recover that research investment. That could be seen, if nothing is done about that, as a barrier to access for the very people for whom the initiative was designed.

**Mr Lob-Levyt:** Obviously, up front in every partnership these issues have to be discussed when it is legitimate for private sector companies. An investor must have returns. They will not invest unless there is some guarantee that the money they put in is returned. We are making progress, but it is by no means easy.

**Q62 Dr Harris:** In relation to your relationship with scientists in equivalent departments in other countries, what are you doing to engage with scientists in, for example, the United States, who appear to be advising their government that condoms have holes in them?

**Mr Lob-Levyt:** That is a very fair point. Most of the scientists we have talked to, fortunately, do not advise that in the United States.

**Q63 Dr Harris:** They must be getting it from somewhere.

**Mr Lob-Levyt:** Clearly. It is not obvious it is scientists giving that information. My view on that particular issue is that the United States has very few scientists that would be saying that. Where governments get information or choose to get information I cannot answer.

**Chairman:** Are you satisfied with that answer, Dr Harris?

**Dr Harris:** I think there is a university, Oral Roberts University, that provides a lot of this information in Carolina.

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**Chairman:** You have given us a great start in what is going to be a fairly complex inquiry. It has been most helpful indeed, illustrating the areas where you are working, doing your part in moving the whole business forward. Keep watching this space. We will talk to the Minister and no doubt we will see you sitting behind the Minister next time. Thank you very much for taking the time to give us a hand.

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**Monday 23 February 2004**

Members present:

Dr Ian Gibson, in the Chair

Paul Farrelly  
Dr Evan Harris  
Dr Brian Iddon

Mr Tony McWalter  
Dr Desmond Turner

*Witnesses:* **Professor Melissa Leach**, Environment Group, Institute of Development Studies, **Mr Simon Maxwell**, Director, Overseas Development Institute and President, Development Studies Association of the UK and Ireland, **Dr Gordon Smith**, Chair, International Development Research Centre of Canada, **Professor Ian Diamond**, Chief Executive, Economic and Social Research Council, and **Mr Andrew Scott**, Policy and Programmes Director, Intermediate Technology Development Group, examined.

**Q64 Chairman:** Can I welcome you here to our second session in terms of the inquiry into the use of science in UK international development. Today we are concentrating on capacity building in developing countries and development strategy. I am sure that each of you has a lot to say, we will have to have a little discipline. If you wish to add to somebody else, fine, but if you have nothing extra to add could you try and move it along because we have quite a lot of questions and we are looking forward to this session. I will kick off. Could you tell me that we are really doing something about this issue? Can you tell me what capacity building is, what it is for and so on? I will give each of you a minute and you will not be phoning a friend or anything, this is a minute during which you can tell me what capacity building is all about and what it is for. Could you do that quickly, please?

**Dr Smith:** Capacity building is critical to development. Without capacity building development will not occur. That is simply because you need people who have expertise and competence. Capacity building, particularly in the area in which the International Development Research Centre of Canada works, is really in the area of developing capacity in developing countries, not in our countries but in developing countries, to apply science and technology to development problems.

**Q65 Chairman:** Okay. Perhaps Andrew Scott has got examples of that. Can you tell me what the problems are in the developing world, as if we did not know? It would be nice to know if you have some perspective on it in terms of priority.

**Mr Scott:** In terms of the science and technology capacity building, the issues are the ability and capability of institutions throughout the developing countries from government right down to community level to be able to assess and make decisions for themselves about the kinds of technologies that they want to use and about their ability to be able to develop and adapt technologies for their own use.

**Q66 Chairman:** Simon Maxwell, could you elaborate more on that perhaps?

**Mr Maxwell:** Capacity has two dimensions. One is capacity in developing countries and the other which is also of great concern to us, and that I hope you can help on, is capacity in the UK. Capacity means buildings, people, money to do research and networks. It is clear that in developing countries, but also in the UK, those need long-term investment and they need to be funded separately from simply funding research outputs.

**Q67 Chairman:** Professor Leach, could you tell me specifically what some of the problems in the developing world are?

**Professor Leach:** Many of the problems in the developing world relate to questions of livelihoods and securing livelihoods, of wellbeing, of health for a vast number of poor people. One of the crucial capacity building challenges is to make sure that people have the ability to innovate, that there are pro-poor innovations in place to be able to respond to local agendas around what the social importance of science and technology should be and to ensure that scientific agendas are framed in ways that actually respond to the needs of the poor rather than simply widening the gap between rapid scientific advance and those many, many poor people whose needs are much more basic.

**Q68 Chairman:** Professor Diamond, welcome back, we have had you before us previously. Perhaps you can add to that and tell us what the differences between capacity building, training and research are?

**Professor Diamond:** I think the two are completely interlinked. We need world class research, we need it to be transferred so that there are people available in developing countries to take the research forward. We need partnerships to be able (a) to develop new research appropriate to the particular problems in developing countries and (b) we need people to work to transfer that to those countries. They are completely interlinked, there is no point saying "We have got training and we have got research", we need the two together.

**Chairman:** I imagine that is a soft opener in terms of nobody disagreeing with each other.

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**Q69 Mr McWalter:** I would like to take up something that Andrew Scott said because I was slightly concerned by what he said. When I was last in Mozambique in Beira Harbour, there were half a dozen rotting hulks of huge ships which are toxic, Beira is no longer a seaside town, the focus of the economy in that part of Mozambique has been completely wrecked. I find it very difficult to say that it is for the people in Mozambique and Beira to decide what is the appropriate technology to get rid of this. We know they need marine biologists, we know they need some heavy engineering. It is a first world problem that we have given them and they need certain first world facilities in order to address the problem. I am a bit surprised that you say this whole business of capacity building is simply empowering people to decide which technology they want to address these problems. Many of these problems need first world expertise to address them at all, do they not?

**Mr Scott:** I think in many cases the capacity of developing countries to be able to tackle problems such as the one you are describing does require knowledge and information from other parts of the world in developed countries and also, I would suggest, other southern countries. I think there are ways to go about tackling such problems which involve the participation of the institutions, for instance in this case Mozambique, as we are tackling those problems to be able to develop their own abilities to learn from that experience so that they are able to deal with similar sorts of situations themselves in the future.

**Q70 Dr Turner:** Coming to DFID and their role in this, they have expressed an interest in evidence to us that they want to explore what they can do in terms of developing capacity in developing countries and so far their capacity building has been restricted to institutions in countries other than science and technology. How do you think DFID could make an impact in building science and technological capacity in developing countries?

**Mr Maxwell:** Capacity building needs investment, and you know that from your studies on research in capacity building in the UK and so do we. It is a 10 year job at least. It is money for all the things that I listed in my previous answer. It cannot be tacked on to existing research projects. DFID is in a difficult position because it has committed itself very publicly to the Millennium Development Goals, of which the most important are to do with absolute poverty, basic health, basic education. It has said that the countries would take the lead in devising strategies to meet those goals, through Poverty Reduction Strategy Papers. These are supposed to be honed by the countries and driven by local political processes, but if a donor goes into countries and says, "We want our aid money to be used to pursue the Millennium Development Goals", you are unlikely to get them coming back saying, "We regard creating international networks and centres of excellence in science and technology at the top of the

list". As a result, and not surprisingly, capacity building of the kind you describe has not received the priority we might expect and that it should.

**Q71 Dr Turner:** Do you think that DFID within its own structure has sufficient capacity in this area to be able to do anything useful?

**Professor Leach:** If I could come in there. I think DFID, in a way, has had two parallel very important areas of work in the last years. There has been an enormous capacity in scientific and technological research relevant to the problems of development as represented by the natural resources systems programmes and, much of the work around health technologies, but that has proceeded largely in parallel to the enormous body of work around questions of governance, participation, livelihoods and poverty reduction. The real need within DFID, as I see it, is for some much more joined-up thinking and integrated research in capacity building efforts which can draw the lessons from that institution building in other areas of development into the science and technology field, and equally look at where science and technology provide key entry points for dealing with the broader problems of poverty.

**Professor Diamond:** This is, if you like, a long-term vision because what we are talking about is putting in place the infrastructure to develop the research in order to get the answers in the future rather than, as I think has happened quite often in the past, saying that we need an answer for something tomorrow afternoon. I believe very strongly, and certainly the Research Councils want to work in partnership with DFID, that there is a potential to develop capacity in developing countries, to undertake the science which would potentially in the long-term start to have an impact on answering some of the important Millennium Development Goal questions, but it does not come overnight and it is a long game. DFID has the capacity to do that if it so wishes, and the Research Councils will work with them to do that, but that is not something that has been top of the priorities recently.

**Q72 Paul Farrelly:** Mr Maxwell, you actually pointed out the fundamental dichotomy in terms of what capacity building means: is it in developing countries or is it focused on developing your own base domestically? I wanted to ask all of you for your thoughts on a general point. How much of a priority do developing countries themselves attach to their own domestic capacity building? Indeed, how much are they encouraged or allowed by major aid providers to do that? Can you give us some examples of who is the best at encouraging and facilitating that and which countries or major aid providers are the worst?

**Dr Smith:** I would just point out that as a Canadian the last thing I would want to do is to be offering any advice as to how DFID should operate. I want to very briefly recall our own experience. We decided precisely because we believed that technology was important to development to create these separate

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institutions in the International Development Research Centre just over three decades ago. We felt strongly, and this came out in the report that Lester Pearson did in the 1960s, that there is scope for technology transfer in the example that Andrew replied to your question, but you really do need to develop the capacity in the south to deal with their particular problems and that has been very much our focus in Canada. Consequently, at least 80% of IDRC money goes to researchers in developing countries.

**Mr Maxwell:** I worked in India in the mid-1970s and it was extraordinary to see the investment that India was making as then a largely agrarian country in science and technology. It had a network of research institutions which are now amongst the best in the world. I worked for the UN and was the project officer for a UN aid programme to India's first research laboratory on microchips, a research centre out in the middle of the Rajasthan desert. We know, because we see it every day in the papers, how fast the Indian software and computer industry has grown, how it is linked into telecommunications, how it is taking jobs from call centres in the UK. That is 25 years later but the initial investment has had a very, long-term pay-off. This confirms what Professor Diamond has said, a country like India that has made a real investment over many years in building research capacity is now able to diversify its economy to go for the higher value added sectors and create jobs in completely new ways. If you do not have that underlying capacity it is much harder to do.

**Professor Leach:** Much of my own research has been in relatively poor countries in West Africa which have extremely limited research capacity and there the problem one often sees is that enthusiastic university researchers who want to do work on local problems around livelihoods, around environmental degradation, are hamstrung by donor dependence. Even where one has well-funded capacity building programmes which are putting money into institutions it is often doing so on the basis of globally defined commonsense ideas of what their problems are which often simply fail to hit their targets because they are on the basis of ideas about deforestation or overall soil loss or broad ideas of health problems which are not the local agenda. In my experience, researchers in Guinea, Ghana and the Gambia and so on, are often very aware of what the local problems are, they simply do not have the ability to pursue them and they have to go for funding which is within the remit of donor projects and, indeed, need to appeal to those audiences in order to publish. One of the real needs, as I see it, is for capacity for critical independent research by researchers in developing countries who can respond to the agendas that they see as important.

**Professor Diamond:** It is very, very clear to me that when we train a new PhD in this country and then they go to work as a lecturer in this country, they are part of a team, they have senior advice, they have the infrastructure that goes with their institution and a mentor to take them up. But quite often we train

someone at PhD level and then they go back into their developing country and suddenly they are without, if you like, the kinds of networks that enable that research to continue so they have difficulty then continuing at the leading edge of research. Not only that, but some of the aid agencies really require consultants, and it is consultants that they end up being, who are just turning around quick reports rather than engaging in that long-term critical research. That is a real problem that we need to address.

**Q73 Paul Farrelly:** Are there particular countries—Canada has just been mentioned—which our witnesses feel that the UK could learn from in terms of the way they allocate the budget and the way they pursue the Poverty Reduction Strategy? The 20% benchmark—if it is a benchmark—has been mentioned. Are there specific things that other countries do that DFID can learn from? Are there any specific examples that come to mind?

**Mr Maxwell:** I have seen some very good US investments in universities, in agriculture universities in India, for example, again in the 1970s. I also did some work on Danish development research and they have a very good twinning programme. However there is an important word of caution here which is we must not have development programmes free riding on UK research capacity. The Danish research programme, for example, is a twinning arrangement that only pays for the marginal costs, the air fares and a bit of training at the other end; it does not pay for the core salary costs of the Danish researchers. Quite a lot of development funding of overseas capacity building looks a bit like that and serves to undermine and weaken the home country investment which cannot be in anybody's interest.

**Q74 Paul Farrelly:** Professor Leach, have you got any specific examples from your work in poorer countries?

**Professor Leach:** I am thinking of a programme that we had at IDS in the era of core funding from DFID, then ODA, which was an international collaboration programme which twinned us with the Institute of Development Studies at Jaipur in India and with the University of Makerere in Uganda. It gave an opportunity over a long-term period for a set of exchanges and partnership arrangements in research and exchanges in faculty which did help in a very useful way, in fact both ways round, to develop cross-learning, to develop capacity in this country. That was a British arrangement which fell away with the end of core funding arrangements that at that point the ODA were undertaking which were really lost with the movement to a much more market oriented approach within DFID. It is possible to look back to the history of development aid in this country and see some examples which could be resuscitated in some form.

**Professor Diamond:** I think the importance of what Professor Leach has said is that they have to be properly funded. An example of good practice which

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was not properly funded would have been the British Council programmes in the 1980s. The department which I was in in the 1980s which links with the University of Dar es Salaam. There was a huge need for people in the University of Dar es Salaam at that time but the link was deeply under funded on the UK side which meant that people were volunteering their time rather than the university being able to commit the time of academics to that. It seemed to me that it was disappointing when the British Council projects died away. Some people argued that was because they did not develop very much but it was a chicken and egg situation, they were not developing much because there were not the funds, so you say “they have to develop or we do not fund them”. If you do this you have to do it properly.

**Paul Farrelly:** Bring on Commissioner Kinnock!

**Q75 Chairman:** Why do DFID not do this? There is hardly anything brilliant coming out of it. What is the problem? I am playing Jeremy Paxman, I guess.

**Mr Maxwell:** It is a question you should ask DFID, of course, but I do think that there are one or two blockages.

**Q76 Chairman:** Their time will come!

**Mr Maxwell:** The first is the emphasis on the Millennium Development Goals and the strong focus on basic education. The other is the question of who has responsibility for the UK research sector and I think it is true to say that DFID has always said it does not have that responsibility. One of the points it would be tremendously helpful for your Committee to examine would be the question of who does have that responsibility and how good is the joined-up thinking across Government as between the university funding system, HEFCE, the Research Councils and individual ministries, not only DFID but also some others. As a starting proposition I would say that we do not have strong joined-up thinking and that one of the things to fall through the cracks is the sustainability and the long-term success of UK research. It would be really interesting to invite you to some of our institutions to see this problem from the bottom up and to see the different kinds of patterns of funding that we have to deal with. We are just across the river, so any time you would like to come over we would be happy to see you.

**Q77 Chairman:** Send a boat and we will come. That is obvious, yes, because we have had the DTI and OST and other organisations in but perhaps you could advise us who else we should have and we will be asking them the same kinds of questions. How do you integrate these things? If you were Prime Minister for a day, or even Minister for International Development, what would you do? What would be the essential feature that is necessary to move this forward other than departments? Everybody talks about the need to get government departments to work together and then we all go in the pub and say “That is the answer”, but how do you do it?

**Mr Maxwell:** What I would want to do is to have if not a White Paper then certainly a strategy for integrated research capacity development in the UK as a public good which would help to serve development in developing countries. That would require cross-departmental work to produce a document that could come to this Committee, because you are the ones with oversight of science and technology. I would then have some indicators coming out of that exercise to tell me what kind of research capacity was wanted. I often say about the European research sector, never mind the British one, that it is a bit like a mediaeval guild, it resembles nothing so much as lots and lots of tailors each working independently. If we were the defence industry there is no doubt that the government would say to itself “the funding we provide, inadvertently or otherwise, shapes this sector, we should stop and ask ourselves what structure of research sector we want, what is going to deliver the best value for money for the taxpayer and for public good internationally, and the use our money strategically in order to fund it.” DFID cannot do that on its own, it requires Professor Diamond and his colleagues, the ESRC, then counterparts in the Higher Education Funding Council, and the ministries, many of which own research centres of their own, to come together and ask themselves some pretty tough questions.

**Q78 Chairman:** Come on then, do we set up a structure where all that happens, where there is something there for every department? Do we set up a new unit, for example, that does this? Would that be an advantage?

**Mr Maxwell:** We have an Office of Science and Technology which has overall responsibility for this but it seems to me, as somebody sitting in a very small corner of this particular forest, that it does not bring together the very many different elements of the funding package which go together to institutions.

**Q79 Chairman:** They would deny that, I am sure, and they would say, “We have three meetings a year and get people together”. What is your suspicion why it does not happen? Are we playing at it? Are we not keen on it? Is it political?

**Mr Maxwell:** Let me not hog the table but I just want to say one final thing which is that there has been a helpful report to DFID by the Rand Corporation which talks about two particular modalities. One is a development donor funding forum. Apparently the funding forum idea exists in other sectors and is a way to help encourage co-ordination. The other is a set of concordats between DFID and other ministries. I think in DFID’s case the problem is partly that they have been so concerned with what happens in developing countries they have not looked at what happens in the UK and partly they just have not had the resources in terms of numbers of people per research pound spent to do this job properly.



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**Q80 Chairman:** We might need another Tsar. Give Bill Gates the job.

**Professor Diamond:** I would just like to point out I do not know why the ESRC does not have a concordat with DFID, it has concordats which many other government departments which work very, very well. We have revised them in the last year or so strongly to move away from being a cup of tea and a rich tea biscuit once a year to something that is action happening, and I can give you examples of how they work in a proper way. We are expecting to have one with DFID but DFID prefers to wait until after it has finished its review of how its research effort is going to take place before we get together. I am expecting to have a concordat during 2004 with DFID.

**Q81 Chairman:** It seems to me that all roads lead to DFID and its unwillingness to participate in a very up-front way in making it happen. Would that be fair?

**Professor Diamond:** I would not say that was fair. Certainly within months of taking up my role I sat down with the new Director of Research on the social side and had a very profitable meeting. The agreement was when DFID really got its view together on how its research was going we would have a concordat and I am expecting that during 2004, as I say.

**Q82 Mr McWalter:** It is interesting that when we were asking the questions Dr Smith was sitting there smiling. Have you cracked it really in that you have got what we are trying to invent?

**Dr Smith:** The reason I was smiling is because the problem sounded familiar generally. For quite a long while I was in charge of something called "Machinery of Government" in our Cabinet Office, and these kind of problems appear in Canada as well. I think in the case of technology for development they probably occur less. In fact, it works quite well. What I was really thinking was in the end, certainly in our case, when you really need to knock heads together to get Government departments working together, ultimately there is only one force that can make that happen in my country, and that is the Cabinet Office.

**Q83 Mr McWalter:** What we find here in DFID and also in the Cabinet Office and, indeed, throughout most of Government is that there is an absence of a culture of interest in science. It is very hard to get people who have a science or engineering background to be in Government at all for the most part and certainly in DFID that is true. Do you have that problem as well in Canada, or have you managed to get more recognition of the important value of science for the processes of Government?

**Dr Smith:** Certainly in terms of the importance of science for development we have, which is, as I say, why the Government of Canada created this body in 1970. More broadly for a long while we were quite successful in Canada. If I look at departments like those that deal with energy and transportation and

the environment, we went through a period of major cutbacks in the 1990 when a lot of that capacity was lost, and I think we are now in the process of starting to build that back up again, but I am really not expert enough on how that works in the rest of the Government. In the area of technology and development, however, researchers are very much at home. Scientists are very much at home working with the IDRC, both those who are Canadian and those who are foreign.

**Q84 Dr Iddon:** Is there not something missing here? I have worked in India and Tanzania and when I was in East Africa I was horrified by what I saw. There was loads of money going into different countries, with some people just dumping the money and leaving and saying, "Do something with that", with the people there trying to build capacity. But what I noticed was there was a total absence of integration between the different countries. They were all there for their own vested interest, frankly. They all wanted to make an impression so that Tanzania traded with Denmark or the United Kingdom. Is there not an international angle missing here where countries should, frankly, work together rather than as independent countries for their own vested interest?

**Mr Maxwell:** The easy answer is yes, and the focus on poverty reduction strategy papers is about trying to encourage developing country ownership and having not lots of projects but one central government policy and one central government budget which many donors then support, and DFID has been at the forefront of this and has strongly encouraged it. A lot of donors have to be dragged kicking and screaming to the table because they want to see the flag and the projects. The argument ought to be extended also to the international level and IDRC in particular has done a lot of very good work on international networks, helping countries and regions to take control of their research agendas.

**Dr Iddon:** I am glad you mentioned India, Mr Maxwell, because India is probably a spectacular example of how S&T can help develop a country face-to-face with extreme poverty. I have seen richness in India and poverty, but one thing is clear about India—they worship science and technology. That is pretty obvious and it has resulted in success. What do you think are the main reasons for the spectacular success that India has had? You have mentioned investment, but what are the other reasons?

**Mr Maxwell:** India has not had the same spectacular success that China and some other countries have had but it may now be taking off. India after independence had a very strong commitment to central planning and to industrialisation, and it took them some time to realise that the immediate leap to industrialisation was not going to deliver poverty reduction on a large scale, but the legacy of that was a very strong science base and it is something that other countries will learn from. Now, not every country is going to have that science base, so an

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interesting question is how they can leapfrog technologically. The way in which mobile phones have spread in Africa can transform local markets for poor people, and that can be a technology which is imported. I met some South African business people who at the time of the last African World Football Cup had taken a container to Mali where the championship was taking place, and in a weekend they had unpacked and set up 25,000 mobile telephones so that people could follow football scores on their mobiles. South Africa was running it on a technology that was imported, but enabled the technological leap which completely transformed communications in Mali. So you need the science base but you also need the science and the technology coming in.

**Q85 Dr Iddon:** Could our other witnesses say what are the most important factors in ensuring the most effective method of building S&T capacity in each country? Can we build a few ideas together, and what should the British Government should be doing?

**Dr Smith:** I will stop short at what the British Government should be doing but let me make a suggestion or two in response to that question. One of the things we do in the IDRC, and I was at meetings with the Secretary General of the OECD last week in Paris to discuss whether this could be on a broader scale, is we do surveys of the state of scientific research in developing countries as part of our five year strategic planning process. We also have officers in the field and we go through a process of consultation and deliberation which ultimately goes through the board of Governors, so I think that it requires some front end work to assess what the state of capacity is and what the priorities are, and this is the sort of thing that again, as Simon Maxwell has said, ought not be to done in a competitive or duplicating way but ought to be brought together, and I was suggesting to the OECD that it might play a role in that regard.

**Professor Diamond:** I think in some countries you would be fairly quick to see that capacity, for all sorts of reasons, is extremely small and what we need to do is have a long-term commitment to do something about that. There is no difficult answer to this: it is quite simply saying we believe that it is worth engaging in science and technology for the good of that particular country, that we all are prepared to work together and we are not going to come in for two years on physics and then say, "No, it was not physics; gosh, it must have been psychology", and go to psychology. We are going to stick with this for 10 years, monitor it properly and make sure it happens. We must have a long-term commitment to developing the networks and capacity in a particular place. Now, with the worldwide web and issues like that, it is much easier to keep people at the cutting edge of technology through being able to read the literature. When I worked in, for example, in Ghana in the 1980s and went to the library the last journal was from the

1960s or 70s, so there were real problems. These can be overcome now in a much more easy way, given commitment.

**Q86 Dr Iddon:** Are we too far ahead in technology, do you think? We are at the cutting edge. Are we so far ahead that we cannot see the simple problems that developing countries have to solve? Would it not be better for the most developed of those under developed countries to pass the technology down? Are we the wrong people to try to get that technology in? Are we thinking in a different box?

**Professor Diamond:** There is a huge role for south south but also for north south. It is a question of getting the networks together and the partnerships in the appropriate areas. There is no one-size-fits-all model here.

**Q87 Dr Iddon:** You worked in Dar and so did I. There is nobody producing soap in Dar Es Salaam and nobody producing soap in Tanzania. I have a colleague out there and I was trying to persuade him to set up a simple soap factory, but it was easier to import western soap products and bring it in than to produce it in the country for various reasons. The basic chemicals were not there for a start. How do you get round those difficult problems?

**Mr Scott:** This point raises a very interesting element to the fact that the science and technology capability that we need to think about is not just about research but about how the information about new techniques, about different techniques, both from the north and the south are made available. It is about thinking in terms of science, technology and innovation in a systemic way so that we are making the connections between what goes on in research both in industrialised countries and in developing countries, linking that with what goes on in the private sector, what goes on in the Government sector in terms of policy-making for science and technology, and also linking that with what goes on in terms of the vast amount of innovation that takes place in communities, completely isolated from the formal science and technology world that does often contribute to making a real difference to the lives of poor women and men in poor communities. It is a question of making the information available as well as being a question of what is available, for instance, in terms of soap-making, which is a relatively straightforward technology. It is also looking at the economic and social barriers and incentives that enable new technologies also to be adopted; it is not just a question of thinking about research capacity.

**Q88 Dr Iddon:** Do you think we are trying to impose our S&T capacity on those countries or do we meet their requirements? Do they know, in fact, what they need? I am sure the answer to that is "Yes". I would hope so.

**Professor Leach:** I think a key role for capacity building is enhancing that capacity to think critically about what is needed. It is very often the case that developing countries have been at the behest either of development programmes or, indeed, of the

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private sector in having technologies foisted upon them through technology transfer or private sector investment, and what is badly needed, and I think this is the role for public sector funded research, is both creating and helping transfer the technologies which will meet those needs and also fostering the capacity to access those technologies. That requires getting involved in institutional issues at the national and international level, and also spins out of the arena of science and technology itself into negotiations within the World Trade Organisation, negotiations around TRIPS and intellectual property rights and negotiations around bio safety issues, and there is an important role for capacity building there in building the ability of developing countries to negotiate their interests in some of those international fora so they can access science and technology on terms appropriate to them.

**Dr Smith:** I would like to add that I think the developing countries often know what their problems are. Let me give you an illustration again of something we do in the IDRC. There is an increasing problem as large cities become larger in feeding the populations in those cities, so we have listened and concluded that one of the priority problems we should deal with is cities feeding people. So, the people do not necessarily know what the answer is to that problem but when you know there is a problem in getting the food into cities you can then try to work on what you can do with rooftop gardens, small gardens outside a house, how you deal with water, waste disposal—whatever else you may need to do. So you focus at the level of the problem and then you look at what the applicable technology might be.

**Mr Maxwell:** Can I just say that anybody who has read your reports, which I have selectively, including the last two annual reports, will know this is not a problem confined to developing countries. The question of how to turn good research into growth, progress, social inclusion and poverty reduction is a challenge all around the world. What it means is that government must not just invest in ivory tower research, but also in application, in helping the firms that will innovate, in the patent law that is available to countries, in the infrastructure and a whole set of other things. This means that when we talk about capacity development in developing countries we are not just talking about universities and research centres but about national systems of innovation. The British experience could be applied with great benefit to many developing countries.

**Q89 Dr Iddon:** When Dr Turner was asking questions earlier the millennium goals came up. Can I ask whether you see those as an obstacle or an aid to building S&T capacity in developing countries?

**Mr Maxwell:** The chief economist of DFID is wont to say that we should take the millennium development goals seriously but not literally, and I think that is a very good maxim. They have had enormous benefit in terms of giving political focus to the development programme and to the aid programme and in raising public support for it, and

I have to say that I think we owe Clare Short a great debt for her energy in taking the millennium development goals out into the international community. Clearly, however, if you are only focused on meeting narrow, quantitative goals of primary education and so on it is possible to lose sight of the wood for the trees, and one has to ask oneself how one is going to reduce poverty. My own view is that developing countries face unprecedented social and economic challenges which they cannot begin to tackle without having a strong research base, so if you want to reduce maternal mortality you need a science base and we need to make that additional leap. I would add too that we should not underestimate what DFID contributes to research. DFID is a knowledge-rich organisation in the social sciences as well as in the natural sciences, has been a leader internationally and is recognised as such for its investment and internal capacity.

**Q90 Mr McWalter:** One of the issues that has been raised there is that clearly one solution to poverty is to trade your way out of it but you need very high skills to be able to trade because if you want to move away from producing pineapples to producing pineapple juice and you have a World Trade Organisation which will say, “Sorry, we are not going to take your pineapple juice because it does not meet our FDA standards”, or whatever, then the door gets slammed on people being able to make those moves. Clearly you have to have a significant amount of scientific expertise back in the developing country to be able to challenge those sorts of judgments and to be able, if appropriate, to apply a corrective to the pineapple juice so it finally does meet these standards. You have commended DFID to us, and I am sure it did change dramatically under Clare Short’s management, but do you see any evidence that it has taken that kind of agenda and really made the input that would mean that those countries could have a hope of eventually trading their way out of their difficulties?

**Mr Scott:** If I could respond to that, there is certainly evidence from within DFID for support to the kinds of initiatives that would result in the production of pineapple juice, support that tackles the issues of ensuring that there is sufficient quality to meet export standards. Where perhaps I would suggest DFID does need a little bit more attention is in thinking about the capacity building on the Government side to be able to undertake the kind of negotiations you were suggesting at an international level. DFID is putting a significant amount of resource into capacity building in developing countries for them to be able to engage in WTO-type negotiations and I would think that science and technology needs to be part of that, but there are many examples of the kind of support DFID does do that involves export orientation, that does look at regulation of trade, appropriate standards and so on. My own organisation gets support from DFID to do some of that ourselves.

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**Q91 Chairman:** So do international intellectual property get in the way of capacity building? Is that what you are saying, or indicating? Can you give examples of that?

**Mr Scott:** Intellectual property rights can prevent access to appropriate knowledge which means that it makes it more costly or more difficult for developing country institutions, both public and private, to access the knowledge that is currently available within their competitors. There is a good argument to say that a lot of knowledge is in the public domain: increasingly that knowledge is being privatised and, in a sense, being taken away from the public domain and that does also then prevent developing countries from taking opportunities that were available to them in the past.

**Q92 Chairman:** I am not clear really if we are saying that DFID is supporting an S&T network in developing countries or not. Are you saying they are or are not?

**Mr Scott:** My feeling is that DFID at a sectoral level is very strong in science and technology and they do support networks in agriculture, infrastructure, energy and so on. Where they have a weakness from where I am sitting is in the technology policy issues and in the support they give to developing country governments for them to be able to develop their own science, technology and innovation policies.

**Mr Maxwell:** DFID spends £130 million a year on research of which a good chunk is spent through country programmes, £30 or £40 million a year, designed to strengthen capacity in developing countries. This is not negligible. There probably could be a much more focused sectoral look in agriculture, health and other sectors at what kind of national system of innovation is there and what kind of capacity is needed, but I would say that the responsibility is not only DFID's and, in the spirit of joined-up Government, there are a number of other research funding bodies in the United Kingdom which have very important things to say about technology and science in developing countries. It should not just be the responsibility of the aid programme; much of the work done in our national research centres has the character of a global public good and we should be judging our institutions, especially in a globalising world, by the extent to which they contribute to finding global solutions.

**Professor Leach:** There is also a lot of cross-learning that could go on with the kind of work on technology policy that is being done in northern industrialised countries which, for instance, is being taken forward by Defra but has a much longer history in the national innovation systems here, currently, for example, under the auspices of the ESRC Science in Society research programme and Sustainable Technologies programme. There is a lot of very useful thinking about how science and technology relates to publics, how questions of uncertainty are dealt with in policy, about ways of democratising science to meet the agendas of society, which has an awful lot to say to developing countries and which strikes many chords with the

kind of work on participation and citizen engagement in development which DFID has taken forward around other issues, not around science and technology. So there is enormous scope here for encouraging some joined-up thinking about technology policy agendas and about how science relates to society within different countries north and south and, indeed, all countries as they relate to this increasingly globalised world of international system, from which many do benefit.

**Professor Diamond:** We are talking about United Kingdom science policy and through the research councils a huge amount of really important research is going on that is important to developing nations, a lot of which is taking place in the very best departments. For example, the ESRC funds a number of projects on development economics which sit within the very best economics departments in the country and are at the absolute cutting edge of economic research, and it is terribly important that that continues and is seen as complementary to some of the projects in developing countries.

**Q93 Chairman:** I just spent five days last week in Cuba and I was quite impressed in Latin America, in the medical school, how they are developing the interactions by the continent. They are going into every African country and making sure that every country had its whack of science and technology. I do not get the feeling that that is happening with DFID. They go country by country and not nation by nation in the big network field. Is that true?

**Mr Maxwell:** DFID is quite a big funder of some multilateral initiatives on science and technology—

**Q94 Chairman:** For example?

**Mr Maxwell:** The Consultative Group on International Agricultural Research which has a network of 25/30 international research institutes. DFID has just announced a big increase in that funding, and there is quite a lot to be said for trying to do as much of this as possible multilaterally for the reasons raised earlier to do with economies of scale and reducing transactions costs. In terms of mobilising Britain to participate, I am here partly on behalf of the Development Studies Association of the United Kingdom and Ireland, and we have something in excess of 80 different research centres and departments represented in our inventory. One of the complaints I hear a lot from people especially in the university sector is about the conflicting signals they receive from the different research funders in the UK. A very good example of that is that Professor Diamond's organisation has, very rightly in our view, emphasised user usefulness and user involvement in research planning and so on whereas the Higher Education Funding Council, which also provides money for research, emphasises almost entirely publication in peer written journals. DFID, which is another important funder in our sector, is emphasising country level utility almost exclusively. So, imagine you are a researcher sitting in one of these 80 odd centres and you are trying to

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put together a livelihood and do good research and be useful to the world, but are dealing constantly with different kinds of signals and trying to balance all these different funding sources in what has in one of these 80 odd centres and you are trying most of our research funding now comes through competitive models. I run a research institute which has 55 researchers, a turnover of £8.5 million, 135 different contracts with DFID every year, all of them pretty well competitive, and enormous transactions costs. It is very difficult to balance all these different interests. One of the models that we have seen in other countries that seems to work very well is the partnership agreement, and we are hoping to talk to DFID about the particular kind of partnership agreement, but the long term five year/10 year funding partnership agreement is a model that I really would encourage the Committee to consider as a model, alongside the funding forums.

**Professor Diamond:** Picking up on the capacity issue there, there is capacity within this country for researchers to work with developing countries because—and it is a point that Simon made very well—in United Kingdom higher education publications in peer review journals are almost everything, and very often researchers working on some of the best development studies and institutes spend an enormous amount of time producing path-breaking research in a report to, shall we say, the government of X, and often that is not seen within their institution as being the sort of publication that is wanted.

**Q95 Chairman:** Having sat on appointment and promotion committees, you could not take them into consideration—not that you are going to get anything in the RAE either.

**Professor Diamond:** Exactly so, and in a different forum I have argued very strongly about the RAE doing this. Also I have written letters about not promoting people in these areas who have done a lot of great work. This is an issue in encouraging people to believe this is a worthwhile career in the United Kingdom.

**Q96 Dr Iddon:** One of the questions we have not really faced you with is we are assuming Government is the main vector for technology transfer but, of course, we have a lot of international companies operating out of this country and others out of other countries. What role do you think the international companies could or should be playing in building capacity in the under-developed countries?

**Professor Diamond:** Building capacity for science?

**Q97 Dr Iddon:** Yes. S&T.

**Professor Diamond:** I think there is an enormous potential role but you will be aware from the data which the Chancellor has shown and from Richard Lambert's review that United Kingdom industry investment in basic research is relatively low, so I think there is an enormous amount to be done more broadly, not just in developing countries, and

working in those countries, it seems to me, very simply as part of what is increasingly becoming social responsibility should be engaging and making sure the long-term sustainability is there.

**Mr Scott:** The Committee is aware that most R&D in the world is done within the private sector, not the public, and the same applies in developing countries. The issue that we need to deal with here is that most large companies, whatever the sector, will have their own science and technology capability building processes going on in developing countries because they need the scientific and technical capacity to run their operations. What I think we need to think about from the point of view of international aid policy is the extent to which those corporate interests are likely to be developing science and technology capacity geared towards poverty reduction, and the answer is likely to be that they are not aimed specifically at reducing poverty and inequality in developing countries, and that is where the public sector needs to come in and support so that science and technology is available to people in poor communities.

**Q98 Paul Farrelly:** I clearly recognise that commercial companies are not going to be entirely altruistic in promoting development of science capacity. At the beginning of the 1990s I was privileged to work for Reuters when the Berlin Wall fell down and after the collapse of the wall Reuters, through their charity and foundation, set out to bring journalists from behind the old Iron Curtain and train them, and this was development in a free media which they were not used to whatsoever. Clearly that was entirely altruistic because it helped the Reuters brand; it helped train a generation of journalists, and it had future spin-offs for the company that were not quantifiable. In the public sector, with DFID in particular, might there be specific examples where there might be an incentive for our government to help train and build capacity in areas that will have perhaps not quantifiable benefits but benefits for this country.

**Professor Diamond:** If you visit a number of countries which have very senior members of their Government who were trained in this country in the 1960s, for example, then you see the long-term benefit to this country of investment of that sort, and for very many reasons a lot of those opportunities have disappeared in recent years. I personally believe it is purely an impressionistic view that the next generation does not have that same United Kingdom focus. This is, again, a long-term goal but there is a huge long-term investment for the United Kingdom that can be gained in training.

**Q99 Paul Farrelly:** Can you give examples?

**Professor Diamond:** For example, training PhD students and doctors in this country with a view to getting them back into their country with proper support and real long-term United Kingdom focus, and long-term benefits of partnership with the United Kingdom.

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**Mr Maxwell:** We are hoping, to negotiate a partnership agreement with DFID about building capacity in developing countries to engage in public debate about development in a way that it is minded to create an institute that organises public meetings with all party parliamentary groups. For example, there should be little ODIs in developing countries. What we are hoping to use our DFID money for, fingers crossed, if we get it, is to build long-term partnerships, and I do think twinning is a very good way to go about this.

**Q100 Chairman:** Between cities and townships, or what?

**Mr Maxwell:** Between institutions. One of the risks, however, in doing all this is that people think about research and science as being like making sausages—that you can set a problem and put three people on to it and six months later to a very specific timetable out will come the sausage which is the solution. Actually we know that research does not work like that. Research is very often serendipitous—a good idea comes when you are lying in the bath about something you are not really thinking about at all—so a really key part of good research is creating good networks. IDRC has been very strong on this and this is something we need to be working more on; professional associations, conferences, linking people up together, using the internet in interesting ways, creating a culture of research innovation and not simply a set of research projects.

**Dr Smith:** Briefly adding to that, I was the chair when IDRC set up the international network for Bamboo and Rattan, and the researchers all have access through the IDRC website to 20,000 different journals I believe, that deal with the problem of out-of-date journals. These researchers are on line and increasingly they have broadband access. This is a fantastic resource because as well as being able to communicate with each other you can go in and pull material out on the internet.

**Professor Leach:** I was going to add the experience from the Institute of Development Studies where we had a two-year MPhil programme which has run since the 1960s where one sees exactly the benefits you are talking about. Often our alumni, who operate through an alumnus network but nevertheless are in diverse positions of developing countries, have a knowledge of the British system which makes it much easier for them to get engaged in a productive way for development corporation research in the future, so those networks established through training, whether PhDs or Masters programmes, continue in one way or another but often in a way that is somewhat informal. It is about creating those networks which are variable.

**Q101 Chairman:** Just probing that a little more, and I have some experience from the University of East Anglia, there are lots of problems about bringing students from other countries. There are the positive points you made but one of the first issues is the cost; another might be the whole arena now of terrorism and the vetting that is going on—this Committee is

about to debate in Parliament with the Home Office their attitude to terrorism and restriction of students and so on—so would you like to say something about the changing environment for students from other places whom we should welcome? What is happening in that field in this country?

**Professor Leach:** One of the biggest problems is funding. We have seen over the last fifteen years a big shift in our MPhil programme which used to be about 70% students from developing countries and about 25% from Europe and North America. We have seen more or less a shift exactly in those proportions and we are now getting a much higher proportion from Europe and America and much lower proportions from developing countries simply because the opportunities for studentships from the British Council or from their own governments and organisations have diminished. So that is clearly one major blockage; it costs a great deal for people to come here. A second problem is that, having been trained or gained a new critical edge on development issues through an international training people often feel very depressed about going back to countries where there are political and academic environments which are quite repressive of free thinking. I have just finished supervising a Gambian PhD student who is one of six Gambian PhD students in Britain at the moment; she is the only one who is going to go back to Gambia and she laments this. She says she is going to go back and start a forum for intellectual freedom, but everybody else is going to look out for jobs at the World Bank. Now, that is not only because it is easier to get financial benefits and one can live a better life working for the World Bank; it is also about the context and it is the lack of research culture in some of the countries that people are going back to. So I think there is a dual responsibility. Training opportunities abroad are important but need to go along with helping to build the type of environments that those people can then go back in to thrive and to go into those international developments, which will encourage them to return home.

**Q102 Chairman:** So what is restricting the numbers coming? What has changed the proportions in your institutions? Is it cost? Is it the vetting that is the threat now and so on?

**Professor Leach:** Largely cost. I am not aware of vetting having increased as a problem. I am not aware that that has become a factor. It is largely a funding constraint, from my perception.

**Q103 Chairman:** Has Canada had any experience of that?

**Dr Smith:** Yes. Above all in the United States we are getting a flood of foreign students coming in because they feel they either cannot get into or do not want to go into the United States where they will be profiled and all the rest of it, so it is quite marked. It is something we all have to think about, if I may, because if these students cannot get into the United States where are they going to go, or are they just not going to go nowhere? I do not know, but there is a

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real issue in terms of the door being closed, or at least their perception that the door is closed, in the United States.

**Professor Diamond:** If you look at UK higher education as a whole there has been a major increase in the number of overseas students in the last two or three years particularly from China going into business schools, and that has been the result of the increasing difficulty of entering the United States of America. However, the points that Professor Leach has made regarding funding are incredibly important when we come to the poorer countries, and for those countries access to funding to pursue any kind of course is extremely difficult. There are some funds available, for example, through the scholarships of the Association of Commonwealth Universities but relatively few, and it does seem to me that there is the potential to think laterally about some exciting new ways of doing, for example, PhDs that might involve partnerships with certain universities with people spending part of their time at the university and part of their time in their own country, just lowering the costs and maximising the technology transfer that goes through this.

**Mr Maxwell:** We do have to be a little bit careful not to start this conversation from the perspective of what was the old colonial model where there was no capacity to train in developing countries. Wherever it is possible to train people in the south it will be much cheaper, more cost effective and more appropriate culturally to do so. There is a sense in which the main beneficiaries of bringing foreign students to the United Kingdom are the United Kingdom institutions and the United Kingdom debate, and there is good reason to fund students. We learn as much as they do.

**Dr Iddon:** You make a very good point because I have trained quite a number of students from a wide variety of countries including some of the developing countries, and I guess if I did a count less than 50% returned to their country of origin, and I found that rather sad. Coming back to the original point I made quite a while ago, perhaps we are just overtraining people for the tasks they are expected to do when they go home. Teaching them how to handle fancy chemicals that are just unavailable in the under-developed countries is possibly wrong, and I agree with you and ask the witnesses, has anyone done a score of how many foreign students we train in the developed countries go back to their countries of origin?

**Professor Diamond:** I do not have that score and I do not know where it exists. Firstly, though, you say we train people to use fancy chemicals which they cannot use when they go back to their country. Well, I would just like to say that that is why I have been talking about long-term capacity building in a country. Secondly, a smaller point, some of the people who do stay in, for example, this country do profoundly important academic research relevant to their own country, and I can give three or four examples of that.

**Q104 Mr McWalter:** Could we have those examples in correspondence?

**Professor Diamond:** I would be delighted.

**Q105 Mr McWalter:** Some time ago the United Kingdom Government chose massively to reduce its support to train people from developing countries and cut down support to the tertiary sector in developing countries, and witnesses have said they are very concerned about that. What has been the impact of this change of approach both for developing science and technology capacity in developing countries and for our standing in the international development community? If it has had no consequence or if, for instance, the consequence is six people in The Gambia and one is going back, that is a fat lot of good for international development with the States, and maybe that Government that did that took that point of view and decided it was justified to slash these budgets. Are you not angry about it? Do you not want it changed?

**Professor Leach:** I am trying to think of a general response. There is a sense in some of the countries which had had a lot of British support that Britain has somehow sold out and abandoned them, for instance, British Council support which was once much higher and has been retracted and there was a time when people could go and get scholarships—

**Q106 Mr McWalter:** So should we recommend a massive increase in the British Council system, or did that not deliver?

**Professor Leach:** I think there are new models that one should look to which are not so top down, which are not about giving grants to bring people to be trained on our terms in this country. We should be looking to much more innovative ways of linking cutting edge with partnered research which involves partnerships between the UK and developing country institutions which might have an element of PhD training within them, some of the most successful examples of capacity building that I have been involved in have involved partnership research programmes where we have taken relatively junior people perhaps with a first degree and not much more and they have become involved in a project as researchers which has involved some south exchange, some time in the United Kingdom with access to new literature and a lot of field work in their own countries, and at the end they have sometimes produced PhDs and sometimes they have just produced reports, and a sense of confidence that they can now engage with the policy networks in their own countries and with the international scientific community, and relate the issues that are important in their own countries to those international research debates, and that is what I see is real capacity building. There is an element there of research, of training and of partnership in which the learning flows both ways. Also, on capacity building, I am often quite uncomfortable with the term because it implies a one-way flow of capacity from us to developing countries. In my experience, good partnership arrangements involve just as much learning the other way. There are things that United

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Kingdom institutions have an advantage in terms of access to literature and access to international debates, and there are many kinds of knowledge that can only be gained on the ground—knowledge of local issues and policy networks—and building capacity is really about encouraging those two-way, multi-way flows of information.

**Q107 Mr McWalter:** So we need a structure, do we? I like the idea that if you are going to do a doctorate you should not just bring them over here so they do their doctorate and are then miserable about going back, but that it is a doctorate done half in Uganda and half here and it recognises, for instance, that understanding flood plains in Uganda is something they will learn about more than we will. But would that recommendation that you have both made mean that the brain drain problem which capacity building historically has generated would be solved, or largely solved?

**Mr Maxwell:** A good model that you might want to look at in more detail is something called the African Economics Research Consortium, which was founded by IDRC and whose donor funders include DFID, and which is a way to strengthen research across a range of African countries by putting money into research locally with a certain amount of external input where appropriate. That is the bottom-up model that we have all been talking about.

**Q108 Chairman:** Is that published somewhere?

**Dr Smith:** Yes. We can certainly get you that website and indeed Dr Spence, who is on the board of the AERC, is with me here. It has been very successful and we have twenty other funders that are with us in the AERC, and it certainly contributes significantly to having people stay where they have come from. It enables them to be part of a global environment but at the same time to stay local?

**Q109 Paul Farrelly:** Are there any national scale models or initiatives? We have heard something of Canada's already that are worth exploring further as far as the United Kingdom is concerned.

**Mr Maxwell:** By other developed countries?

**Q110 Paul Farrelly:** Yes.

**Mr Maxwell:** The Dutch are good, the Danes are good, the Swedes are good, the French are probably okay in a fairly traditional way, the Americans as I said earlier, have had long-term relationships between land grant universities and others. Many of the countries I have listed have institutions which are specifically responsible for doing this, and IDRC is one, where there is a clear mandate and a ring-fenced fund in order to build science and technology capacity overseas.

**Q111 Mr McWalter:** We are looking for some sort of integrated approach on the part of the United Kingdom and we have identified, I think, that that does not exist—perhaps rather sharply. What we are worried about now is can the different objectives of

different government departments be made to support a single strategy, or are they really complementary at all? The DTI pursues trade but is not that interested in the conditions of trade for developing countries; the DFID is interested in poverty reduction but is not that interested in how you get out of poverty once you have taken the first few steps, and all the scientific staff from the Foreign and Commonwealth Office seem to be very interested in telling the Japanese how wonderful we are and cribbing what they can from other developed countries but not doing much about developing countries. In all this mess, is there a model we could use which would give us an integrated approach to a scientific and technology capacity building system?

**Mr Maxwell:** I came into this meeting with three issues on my piece of paper for the Committee, the first being to turn over the carpet in our own house and see what we can find underneath.

**Q112 Mr McWalter:** You can hear we have been doing that!

**Mr Maxwell:** But it would be very helpful to look at other sectors than development and ask whether or not we have cracked this problem. In food policy, for example, where a number of different ministries and agencies are involved, we now have a Food Standards Agency as a way of focusing. Are we doing something similar in the defence industry? I do not know the answer to that question but I hope you may be able to help us.

**Q113 Chairman:** We are seeing Defra.

**Mr Scott:** Supplementing what Simon has said on that, if we are going to be thinking in those kinds of terms we also need to be thinking about the extent to which the interests, particularly of poorer developing countries, are taken into account in all of United Kingdom policy ranking across science and technology and other departments. If that thinking is there then we will see a much closer integration of the kind of subjects we are talking about.

**Q114 Chairman:** But it will not be there. Part of education is that universities are going to carry on offering doctoral programmes to people saying, "Come here, stay here three years, go back with a bit of paper—oh, you do not want to go back? That is a bit of a shame—never mind". Nothing much is going to change unless somehow or other the Chinese walls are broken down. I am not at all convinced we have heard from you a really sufficient sense of urgency about how we might do that, or even any real suggestions about whether this problem is solvable at all.

**Mr Maxwell:** Chairman, may I ask whether you have considered in other inquiries the funding forum model? That is something that those of us who work on development research have been keen on. Are witnesses allowed to ask questions? Probably not!

**Chairman:** Of course they are.

**Q115 Mr McWalter:** We want to solve the problem. Anything you say.



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**Professor Diamond:** It does seem to me that if this is seen to be an important issue then it is solvable but it requires something like a funders forum where people are prepared to sit down and say what the issues are and how we get around them. It is not rocket science to do this but it does require an absolute commitment that this is important.

**Q116 Chairman:** I tell you what I am thinking really, which is that we want to shake DFID around a bit. We know they are beginning to think of new ways of tackling these problems so I think they have come to terms with the problem, and it is our job really to raise it up the agenda, with the help you have given us today. You may not be angry enough for some of my colleagues but I know some of you individually and know you are quite angry and a lot of people working in this field are pretty angry too, so the information you are giving us will be very helpful for us when we come up with a report which I hope will be as sharp as our MRC report was which I am going to now say really turned the MRC around. We are going to Malawi, by the way; we have been advised that would be an interesting place to visit. We could spend the rest of our lives visiting the developing world but we are going to Malawi to see how it operates there on the ground and to talk to people there and how they feel about it, so I am looking forward to that and I know the advice you have given us today will help in asking the right kind of questions. So do not feel despondent: we pick things up and hear what you are saying. Would anybody like to finish on a high note?

**Professor Diamond:** Could I just say one of the written pieces of evidence that I would give to Tony would be of a woman called Dr Nyovani Madise from the University of Southampton, who is Malawian and if you are going to Malawi I would advise you very strongly to meet her. She came to this country on a scholarship, has since stayed and has undertaken excellent research on Malawi and the sub Saharan African area. She is a fine example of the sort of person you must meet.

**Q117 Chairman:** We will certainly do that and if you have colleagues or friends who will have a view about this please encourage them to write in, because our MRC report came from the grass roots of MRC researchers who told us what was going on on the ground and how they felt, and I think they inspired us to get stuck in, as it were.

**Mr Maxwell:** I would not like you to think we have gone native, Chairman, but I would also urge you to have the OST and HEFCE on your hit list.

**Q118 Chairman:** They are on our hit list! We are the Committee from hell!

**Mr Maxwell:** A final point, just picking up on what Dr Iddon said earlier, DFID went through an exercise in the second half of last year to try and identify what were the big problems that needed

research input over the next decade or 20 years and they had over 600 replies. I have my own little list of 12 and I want to emphasise that these are huge problems facing not just the world but particularly developing countries. Just to take one example, by 2020 more than 50% of all people in developing countries will be living in towns. The pace of urbanisation is absolutely astonishing and changes everything from food delivery through health and education, sanitation and public service delivery. Those problems are not going to be solved and managed without a very serious research input which combines science and technology and social science. That is something that needs to be very high on the agenda not only in DFID but also the OST.

**Professor Diamond:** To give you another example, agricultural economists would say that if we are going to feed nine to 10 billion people in the world—and there are going to be nine to 10 billion people on this planet—then we need an increase in the rate of food production which is equivalent to that we have seen in the last 20 years during the second agricultural revolution. That will only happen, given the fact that much of the land which remains to plant such food on is marginal land, if there is research to enable that to happen, and that research has to happen now, not in 20 years. If it does not happen then we have a problem sustaining a population of nine to 10 billion people on this planet.

**Professor Leach:** I would like to echo that and to argue that if the livelihood needs of poor people in rural areas and increasingly in urban areas are going to be met it is really crucial that the rapid advances in science and technology which are proceeding and which will proceed in the private sector as much as the public sector are harnessed to the needs of those poor people, and that requires a political effort to galvanise research and the interests across a number of government departments into tackling those problems. There is perhaps a political opportunity in Britain's role in the G8 next year and in the role that Britain is taking in the NEPAD process to use this as a chance to galvanise and to say science and technology must contribute to decreasing this global gap rather than widening it which, frankly, it threatens to do at times given the pace of technological change. If it is captured by the private sector towards creating pockets of high tech advance, perhaps in particular bits of developing culture, then we will fail. Harnessing technology to meet the needs of the poor is a very important agenda, and one which I think we would all support.

**Chairman:** That is a great note to inspire us to finish on. Can I say thank you very much, particularly to Gordon Smith for coming all the way from Canada. Thank you for sharing your experience and erudition in this field, and I think you will find the Committee have picked up many of the messages you have sent to us today. Keep your eye on our website, see who else we are meeting, and just watch for fireworks. Thank you very much.

## Monday 15 March 2004

Members present:

Dr Ian Gibson, in the Chair

Paul Farrelly  
Dr Evan Harris  
Kate Hoey  
Dr Brian Iddon  
Mr Robert Key

Mr Tony McWalter  
Geraldine Smith  
Bob Spink  
Dr Desmond Turner

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*Witnesses:* **Dr Nick Brown**, Oxford Forestry Institute, **Dr Guy Poulter**, Director, Natural Resources Institute, **Professor George Rothschild**, Chairs of the independent advisory committees for DFID's RNRRS programmes, examined.

**Chairman:** Thank you for coming to help us with our inquiry. We are looking forward to your input and your enthusiasm. Please divulge all the secrets that you feel need to be divulged to help us. There will be a recording, which will be in the public domain instantly. We are looking forward to a frank and full discussion with you.

**Q119 Bob Spink:** We have had evidence from various people that a lot of good comes from your research but equally we have had challenging evidence that DFID are reducing the amount of funding they are giving towards research. Do you have any such evidence that DFID are cutting their funding for agricultural and environmental research?

**Professor Rothschild:** I think it is not so much that there is evidence that they are cutting their funding of research but where they are directing their funding. For example, very recently they have increased their funding for international agricultural research through the Consultative Group of International Agricultural Research, which has various centres around the world engaged in international agricultural research, by £30 million. What is less clear is where they are going to direct their funding, particularly in the case of agriculture—and we are talking about agriculture in its broadest sense here, renewable natural resources—after the current programmes, which are funded to the tune of £20 million annually for 10 programmes, are closed down in March 2005, and that will obviously depend on the new research strategy, which is still being developed.

**Q120 Bob Spink:** Do you think that DFID's untying of aid is significant for you?

**Dr Poulter:** May I make a short addition to George Rothschild's comment on your first question? I think that is correct but there is a timescale issue here. A few months or years ago there was some concern about what DFID was going in the longer term in terms of volume of support for agricultural research. They introduced a research strategy document about a year ago and it is clear from that that the recommendation it is to maintain or even increase research spending, but the issue, as I see it, running in running a research institute in the UK is the focus of that aid and where it ends up. I can

expand on that if you wish. Perhaps on your question about the untying of aid, I think this is a key issue for us. There is no question in my mind that the trend over the last 10 to 15 years of putting the focal point for research in the developing world itself is correct. The question is: what is the role of international research organisations and also UK-based research organisations. The UK has 100 years of distinguished expertise in agricultural research overall. There has been a change over recent years to much more of a focus, correctly, on the poor people in the South. There is, I believe, and I would strongly argue, a residual role for a strong UK research base in developing country agriculture. However, this has diminished over the last 10 years or so. One of the big questions for us now is what is the need for that residual UK research base and what effect will the untying of aid have on it?

**Q121 Bob Spink:** Do you think that there are things that you can contribute that the developing countries cannot achieve by you having the wherewithal to do the research?

**Dr Brown:** Yes, I think there are important components of bio-physical research for which there is very strong demand in developing countries but which many natural research organisations do not have the resources to tackle, or which are best tackled at a regional rather than at a national level. I think that is where the UK can make a very big contribution.

**Q122 Bob Spink:** Can you just tell us generally about the impact of this change, this focusing of research funding from DFID? Can you tell us about the impact that that will have on your own activities, both the negative and the positive?

**Professor Rothschild:** May I add something to the untying of aid? I think there is no doubt about it that in one sense the untying of aid means that DFID can go to any organisation and, on a competitive basis, they can respond to particular requirements to undertake research. The problem is that it is not a level playing field in the sense that other countries, while there is a requirement under the International Development Act to untie the aid, in practice USAID, the Netherlands, France and Germany all basically protect their own institutions. There is evidence for that. That is a real issue. The other side

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of is that, for example, they will receive core funding from their own governments to maintain their institutions, whereas for many institutions in the UK they have to get all of their funding from the projects which they are doing. It depends, I guess, how the International Development Act is interpreted. Some would say that originally the idea was that it was done in order that private sector concerns, companies and so on, could not profit by any money if they were involved in infrastructure projects—building ports, roads and so on—but the kind of research we are talking about, public good research for the poor being undertaken by the non-profit institutions somewhere, I believe is a very different issue altogether.

**Q123 Bob Spink:** In short, it is another variant of the gold-plating of regulations that seems symptomatic of this country's approach?

**Professor Rothschild:** Others may be more qualified to comment on this, but I think it is basically perhaps an interpretation of the Act, which is probably absolutely correct.

**Q124 Bob Spink:** Do you think it is an over-rigorous interpretation?

**Professor Rothschild:** I would say it probably is, yes.  
**Dr Poulter:** Is your question about the effect of the changes overall?

**Q125 Bob Spink:** Yes, it is about the impact on what you can do.

**Dr Poulter:** The question evolves around what is the role of UK-based research institutions in the system overall. There is no question that the priority has to be building up capacity in the south, addressing particularly poor people's needs in the South, and the closer you put that research to the problems, the better. I joined my own institution 30 years ago and it probably had then in the order of 700 staff; it has now about 70 professional staff. There has been a big change over 30 years. In many ways that change has been related to changes in the whole paradigm of aid from a Northern focus, or at least activities undertaken in the north transferred to the south, much more to Southern activities with a partnership with organisations in the North. I would argue that Northern Institutions like mine have a role in this mentoring, partnership, linking, etc relationship with institutions in the South. My Institute has also changed markedly from primarily a natural science research Institute much more to a mixture of natural science, social science and anthropology, and particularly concentrating on the needs of poor people overall. I think these changes are correct and right but the prevailing question is: what is the role for a UK-based organisation? I would propose it is this mentoring, linking with the Southern organisations, whilst at the same time having the ability to understand more fundamental science, which is also very important, not needing to be adapted to poor people's needs, and also being a resource to advise government on these kinds of issues.

**Dr Brown:** To answer your question directly, I think there are three areas that I detect as being areas of impact. First, there is the money available for the type of research, the applied forestry research, which is undertaken in my institute. We focus on process rather than on policy. It is fairly clear that the share of the cake, as it were, that is available for that type of research is much smaller. That has a very substantial effect on our capacity to do research and our capacity to offer advice. There has been quite a substantial erosion of our staff and that has led to some fairly significant impact on our ability to provide capacity-building and training for students from developing countries. I think also the change in emphasis of DFID funding has in some senses for academic institutions caused conflict with the demands of the research assessment exercise, which has provided a significant disincentive. Many natural science research institutions have been involved with DFID research and I think that may have an impact on the quality on the research and the bidding for DFID money. The third area that I foresee is the difficulty of predicting what the future is going to be. I know in my own institute that the lack of any prospect of a plan beyond 2005, essentially the threat of a hiatus in research funding from that time onwards, is a major concern, which means that certainly my institute is reviewing the way in which it is allocating its resources because it cannot count on the funding being available in the future.

**Q126 Bob Spink:** You make all three points very well, Dr Brown. I wonder if I could ask you very briefly: can you name for us any specific outputs that you will now not be able to achieve that you would have wanted to achieve as a result of the changing focus on funding?

**Dr Brown:** Yes. We used to provide a very large range of professional training for foresters from developing countries. We had a big programme and some training courses in which over 600 foresters received technical training over the years that these courses were provided. We are no longer able to staff those. We have also had to close down our MSc in forestry, which was very widely reputed and that provided many of the forestry staff for DFID projects.

**Q127 Kate Hoey:** Dr Brown, just on that point, which is very interesting, how do you relay that? Who do you directly tell that there are funding problems, staff problems and the various things that you are obviously concerned about? You put it here very politely and nicely. Who else do you put it to?

**Dr Brown:** We kick and shout. There was a little article in *New Scientist* not so long ago which Tam Dalyell very kindly put forward on our behalf.

**Q128 Kate Hoey:** Do you have a direct relationship with someone in DFID?

**Dr Brown:** No, we do not. Obviously we have informal relationships. We know many of the people in DFID but, no, most of these decisions are made at

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university level. The Universities are primarily given the right to employ where they see a good prospect for future resource funding.

**Q129 Dr Iddon:** Could Dr Brown and Dr Poulter, and even Professor Rothschild, just say what proportion of your income, roughly, currently comes from DFID's central funded research?

**Dr Poulter:** For me it is 40%.

**Q130 Dr Iddon:** Where does the rest come from?

**Dr Poulter:** The rest comes from DFID's Geographic Desks and increasingly we have been looking to the EU, the Development Banks, anywhere we can find an outlet for the services that we offer.

**Dr Brown:** Almost all of our topical research, up until the end of the 1990s, was funded by DFID. This now forms of very small proportion of our total income. It is highly variable because we have such a small staff and one project can now make a big difference to our total income.

**Q131 Dr Iddon:** Can you justify why DFID should fund support for UK research institutes?

**Dr Poulter:** I began, in one of my earlier answers, to outline answers to those kinds of questions. My view would be that UK institutes, such as my own, and there are others, are now at a minimum level of expertise to provide both the linkages to help strengthen the important institutions in the South and through the mentoring of these institutions in the South to address the needs of poor people, and also to act as a conduit through to higher science and more fundamental science. Also, they are potentially a source of expertise for advice for government in the UK overall. So these are, to me, the fundamental questions, but as Dr Brown has pointed out, the other question is: who do we talk to about these issues? We talk to anybody but we are a bit on our own in that sense. In the environment in which we find ourselves, unless we can sell the services we have to offer to cover our costs, and we do not get any subsidies or core funding from anywhere, we cannot exist. This is the current issue: what does the future hold? Therefore, the overall question is: what is the role for UK institutional funding?

**Dr Brown:** Tradition is not perhaps a great justification, but tradition does bring great experience. We have enormous experience. We also have scientific expertise which we can contribute. We have facilities, resources, which I think are world class, for example, in the Royal Botanic Gardens at Kew and the library resources which are available through my own institution in its collaboration with the Commonwealth Agricultural Bureaux International.

**Q132 Dr Iddon:** Perhaps I can throw in this question? Are DFID getting best value for their money from the institutes in this country or are they going to other places because they think they are getting best value from money elsewhere?

**Professor Rothschild:** I am perhaps in somewhat of an invidious position here because I am actually representing the chairs of the advisory committees of the 10 current DFID research programmes, which are due to be terminated in March of next year. There is no doubt about it that the fact that DFID has put, over the last decade, almost £200 million into these programmes and that, in an open, competitive system over 80% of the institutions which have won those contracts have been British institutions, I think speaks for itself. The other point that I wanted to make, in relation to the last point about who can one speak to, is that the problem at the moment is that with the research strategy terminating, with this current research programme finishing in March 2005, there is still no new research strategy in place so that institutions and networks and overseas partners who have been heavily engaged in partnerships for the last 10 years do not know what is happening next. That is why it is very urgent that something happens quickly.

*The Committee suspended from 4.51 pm to 4.59 pm for a division in the House.*

**Q133 Dr Iddon:** In the case of the institutes, does DFID fund the entire cost of the research that you do, including all the overheads, or do you have to find some of that cost from elsewhere?

**Dr Poulter:** No. For a long period of time DFID has been funding the full overhead costs of proposals that we submit. In the case of research, proposals go to various Programme Managers, and George Rothschild is the Chairman of the independent Advisory Committees for all such Programmes, and if a particular proposal is accepted for funding this covers the full overhead costs. Certainly DFID does pay the overhead costs.

**Dr Brown:** To return to your question about whether DFID thinks it is getting value for money from this, my perception for research is that it feels it probably did not a very good return on its investment.

**Q134 Chairman:** What do you mean by they did not think they did? They either did or they did not.

**Dr Brown:** I believe that their perception was that they not get a good return on the investment that they made in science, but I do not think that was a problem with the science. I think it was a problem with the promotion of that science. There is a danger that very significant investment is just about to be thrown away. I can give you an example of that. A very important piece of work that was funded in my own research institute during the early 1990s was the collection of a very large germplasm bank for trees for agro-forestry use. That is the sort of investment which has very long-term pay-offs. The change in emphasis in DFID funding meant that that the project came to an end and there was a very real risk that that entire investment would be lost before it could find any real application. It was only because one of the CG centres actually stepped in and rescued it and took over the whole thing that in fact there have been any benefits at all.

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**Chairman:** Really, DFID thinks you are a waste of space, do they not? That is what it is all about. Cut the corners and cut the cackle, that is what it is all about? You seem to be fighting your corner all the time against an opposition which has not blown its cover yet, but anybody who is listening to this for the first time can smell something there in terms of DFID's approach to you people. Am I exaggerating?

**Q135 Dr Iddon:** The Chairman is being provocative, in case you had not realised!

**Dr Brown:** I would say that our perception is that they under-value science and research, yes. I think, whilst we welcome the change in emphasis from purely technical solutions to solutions which encompass socioeconomic and policy dimensions and also promote the dissemination of research results in an effective way, in a sense we have moved to a point where there is far too great an emphasis on that, and now we are in danger of throwing the baby out with the bathwater.

**Q136 Dr Iddon:** What about your overhead costs? Are they met by DFID for the research that you do or do you have to find some of that from elsewhere?

**Dr Brown:** They still meet those costs.

**Dr Iddon:** Could I ask all three of you: do you provide scientific advice to DFID's policy department, its advisers, country offices or in developing countries with the DFID funds in any way?

**Q137 Chairman:** And do they take any heed to you if you do?

**Dr Poulter:** We do. Briefly, we were part of the ODA until 1996. After the change of ownership to the Greenwich University, there was a funding commission available by which DFID could buy the services from my Institute for those purposes. That has been extended and in principle still exists, but it currently exists as a contracting mechanism but without any dedicated funding. Traditionally, my Institute did provide a lot of this advice, which has continued over the last three, four or five years, but certainly in the last year or so there has been a marked reduction due to a lack of funding, in effect.

**Q138 Dr Iddon:** So that kind of income is diminishing as well. What about Dr Brown?

**Dr Brown:** In a very similar fashion, we used to receive funding for what was called the Resource Centre Scheme; it was essentially a grant of money, which we received annually in return for providing advice to policy-making sections, to technical advisers overseas and also, to a considerable extent, for providing advice and information direct to developing countries. That source of money has now dried up completely. I think DFID would say that a lot of this has been diverted into its development research centres, but I think they have a very different remit.

**Q139 Dr Iddon:** How much warning were you given by DFID that they were going to revise their strategy and put you in this difficulty?

**Dr Poulter:** Very little in effect these things just happen, if you like. One particular commission under this arrangement would have come to an end and we would not necessarily expect it to continue *per se*; but we would expect something else along those similar lines to come along. I could put a value on it. From last year to this, my Institute's income from this source is about half a million pounds less. It is that overall, at any one time, we might expect there to be a dozen or so such commissions and, as one ended, something else would begin.

**Q140 Dr Iddon:** Have you been involved in consultations hitherto, or not, about the change in strategy?

**Dr Poulter:** We are talking about different things. The commission for the policy work has been a different mechanism from the research strategy.

**Q141 Dr Iddon:** I am talking about the research strategy.

**Dr Poulter:** In the research strategy, yes, we have responded. There have been calls from DFID to the whole of the research community in terms of thoughts for research themes. In fact, I have a copy of them here. We submitted 32 ideas and there was a consultation at that time. In fact there were also three consultations: one on policy matters, one on health and one on technology including agricultural and engineering technologies. We actually hosted one of those, but at our own expense, I should say.

**Professor Rothschild:** May I add that I think DFID has its own research capacity in the form of the 10 programmes that it currently supports to the tune of £20 million but there is no formal mechanism by which advice can routinely be relayed from those programmes to the central mainstream development groups or to the new policy area, or indeed to the country programmes. It does happen, but it is very much the efforts of the programme managers of those programmes doing this themselves. As you may have seen from the submission, these 10 programmes are basically outsourced; that is how they run. As for the development of the new research strategy, one would have to say that to some extent there has been a clean slate approach in this. They have not drawn very much on those 10 programmes, which after all have run for a decade to the tune of £200 million, and they have a vast amount of experience and so on. There has been no formal structured discussion of the lessons learnt and experience gained through saying, "all right, by all means have a clean slate and start anew, but what lessons have you learnt from what you did before? What has the impact of that been?" That is something which appears to have been missing. It may still be going to happen but one could argue that it is leaving it a bit late to be doing that in the last 10 months of a strategy when you have already drawn the line under those existing programmes.

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**Q142 Dr Iddon:** I know you wanted to come back on the previous question but can I ask you one last question? That is about postgraduate fees for foreign students coming to Britain. Has that affected your programmes in any way whatsoever? Perhaps I ought to ask this: do you have people working like that? Has the level of fees for foreign students been a disincentive to postgraduates coming to work here?

**Dr Brown:** Yes, it is one of the most significant barriers to study in the UK.

**Dr Poulter:** I agree with that very much, and the issue is the source that pays those fees. If you go back ten years in time, there was the British Council and various other sources; DFID itself had training funds related to the development programmes it had in the South. That area of funding has dropped off markedly over recent years and this has a major effect on the numbers of postgraduate students, both PhDs and Masters. In fact, we run a couple of Masters' courses. One that is most successful is a food safety course. Basically it is run with private money; that is students funding themselves rather than through the government sponsorship, as in the past.

**Q143 Dr Harris:** Dr Brown, in the Oxford Forestry Institute evidence you talk a little bit about the issue of development and maintenance of research capability in developing countries. Some of the remarks you make touch on the issue just raised by Brian Iddon. You point out your concern about how the donor funding for agricultural and forestry research has dwindled. The staff in those developing countries, however well trained, can quickly become unable to conduct useful research because of a lack of operational funds. You also talk about the problem, and I quote: "The past assumption that sufficient research capacity will result from training a few people per country, on a one-off basis, that will then be self-sustaining within the country, is not valid." Could you expand on that, and your colleagues are free to comment.

**Dr Brown:** I am not entirely sure what point you would like me to expand on.

**Q144 Dr Harris:** I would like to know what you think we should be doing differently to avoid the situation where we do not have self-sustaining research capabilities in developing countries.

**Dr Brown:** In a sense, this comes back to an issue that Dr Iddon has just mentioned about the change in DFID policy. It is that that has actually been particularly difficult for us to cope with, and also, in turn, for many of our developing countries, partners, to cope with because shifts in DFID policy, particularly when they come with relatively short notice, often undermine programmes which, particularly in forestry and agricultural research, tend to be very long term. Initiatives are started and then funding dries up; there is a sense of frustration and a great deal of that investment is now lost.

**Q145 Dr Turner:** It seems that DFID is keeping you on declining rations, which must cause your institutions a great deal of difficulty. Do you get any help in terms of funding for your work, for instance from the research councils?

**Dr Poulter:** My Institute does not. We may have one or two small research council-funded projects. In broad terms, we find it quite difficult to break into research council type funding. There is also the issue of whether they pay for overheads and those kinds of issues. We have in the past had RAE funding from the Higher Education Funding Council. It is well known, and we have given you written evidence on this, that this is based essentially on a peer review system and so, on the one hand, one has to look at the quality of the science and, on the other hand, to our main funder, DFID, for the application of the research for poverty reduction. There is often a conflict between those two, and so we do have an RAE score and we do have within the BBSRC a few small projects but we find it difficult to break into that market.

**Dr Brown:** My department receives very substantial funding from the research councils. They have a quite different funding paradigm to DFID. It is quite different sorts of work for which we would seek resources from them. It is not the sort of downstream, applied research that would be appropriate to the DFID context; it is much more of a supply-driven, upstream type of approach.

**Q146 Dr Turner:** Do you think that the research councils should support work on problems related to the developing countries, and what do your institutes do to try and foster relationships with research councils to encourage them to do that?

**Dr Poulter:** I have not sat down and talked to directors of research councils overall. What we have been doing over recent years has been responding to calls, which is the main means of attracting research commissions. We look at the published calls and we make applications for funding from those calls appropriate but I have not sat down and actively suggested to the research councils that they might like to look at more at the things that we do.

**Q147 Dr Turner:** It would be fair to say that no-one is actually taking an overarching view of conducting research relative to developing countries?

**Dr Poulter:** That would be the perception of our Institute.

**Professor Rothschild:** On the last question, that relates to capacity-building really. I think this is terribly important. Basically, if you want what you are doing by way of science and technology research to be sustainable in your partner countries, the developing countries, you have got to build up people skills, facilities, in other words, institutions, and have the money to go with that. At the moment, in terms again of the 10 research programmes that DFID current has, there is no formal, joined-up mechanism for that to happen within DFID. DFID basically said, "If you need to

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get capacity-building in terms of training and so on, use the British Council, use other sources of support to do that". Also, incidentally, that applies to dissemination and promotion. Capacity-building is done within DFID but it does not appear to be formally linked to the research process and the 10 programmes basically have taken it upon themselves to make this happen. That is something that needs to be addressed. There needs to be a proper mechanism for doing this formally associated with the new research strategy, when that comes out.

**Q148 Dr Turner:** You say that you have very little success in responding to calls for projects for research councils' programmes. Why do not your institutes work in a response mode and just submit your projects that you want to do anyway? There is nothing to stop you doing that, or do you find that the problems with overheads inhibit you from doing that?

**Dr Poulter:** Our overheads are on a par with all other institutions of our type but they are quite high in relation to existing to core funded BBSRC institutions, for example. There are also issues of transaction costs in an Institute like mine, where I have something like 250 contacts at any one time. In order to win those numbers of contracts, we may have to make three or four times more applications wider, and so the whole time we are looking at the probability of gaining funds and the transaction costs involved. We could cold call, I suppose, but to do that we would have to have some indication that they would be sympathetic to cold calling and some indication that we would be funded.

**Dr Brown:** Perhaps I could contribute the experiences of one researcher in my own institute who attempted to find a source of funding for some work related to breeding trees in order to reduce the quantities of lignin in wood? BBSRC said that they could not fund work on forestry production and we should go to the NERC. The NERC said this was not their remit; it was actually for the Forestry Commission. The Forestry Commission said they did not have any funds to fund lignin research.

**Q149 Dr Turner:** So nobody wants to know?

**Dr Brown:** Yes.

**Q150 Chairman:** It is all a bit of a mess really, is it not? You guys do not really engage with policy makers very much. You do not do anything active. You sit here and moan and groan but you do not get stuck into them. Why do you not get stuck into people? We meet many people who come with the same problems and, by God, they get it sorted out after meeting this Committee, and also they get it sorted out because they realise they can get it sorted out. What are you doing actually to engage with the policy makers in this world? I see the people sitting behind you who are coming later; they have had to sort it out with policy makers, in a foul-mouthed way, some of them, but they have done it. What is wrong with you guys doing it?

**Professor Rothschild:** I think, in our defence, we can say that, certainly for the programme advisory committees, because of our independence, we have in fact been taking the cudgels up and since last June I would claim that we have helped get agriculture back on the international development agenda. I think we have helped to get research a higher profile and we have managed to engage the Secretary of State. We have done that through the good offices of various committees and their help in putting in submissions. That is the route that we have taken.

**Q151 Dr Iddon:** How often do you talk to the Chief Scientific Adviser to the Government?

**Professor Rothschild:** I think the programme recently had a sort of teach-in with Sir David King and also Lord May as the previous Chief Scientist, now President of the Royal Society, has become involved in this and has very recently indeed I think had a meeting with DFID.

**Q152 Geraldine Smith:** The Darwin initiative, operated by Defra, has been widely praised in written evidence we have received as being a good role model for funding research and capacity-building in developing countries. Do you have a view about present levels of support under the initiative? Do you think that is sufficient?

**Professor Rothschild:** Obviously you are going to have a Defra witness in your next session. As I understand it, that has been a valuable programme. I think, from the point of view of agriculture and the problems of the poor, perhaps it has been more conservation-oriented than about the utilising of scarce resources. It was really designed perhaps to provide some muscle to the Convention on Biological Diversity because it all began with the Rio Conference. Funding tends to be a small grant programme. Transaction costs are quite high. I think at the moment about £3 million annually is available. The idea is that that should be lifted to about £7 million by 2006 or 2007. It has been good; there has been a lot of capacity-building of conservation officers and the people looking after national parks, endangered marine species and so on, but I guess, from the point of view of agricultural and forestry issues, in terms of the poor, my understanding of it is that maybe it has been a bit more limited. Certainly it has been a good initiative.

**Q153 Chairman:** The Defra representative cannot make it to the Committee's hearing today as there is a problem but there will be another time. That is postponed, not cancelled.

**Dr Poulter:** Following on from that, it is a very interesting model particularly in terms of the partnership, which is where I see this issue going in many ways, the ability to form partnerships between institutes in the North, UK in this context, and partners in the South in order to build capacity in the South. The problem that I would see, which George Rothschild has also indicated, is the size of

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the grant, I believe about £30,000 to £50,000, plus the transaction costs of that for us are going to be quite high. I see it fits well with some single bits of research say a university but if you are an institution, then I think you have to watch the transaction costs.

**Dr Brown:** My experience has been very positive as well. I would caution that I think the Darwin initiative is still to a considerable extent supply-driven rather than demand-driven in terms of the focus of its research activities, and so its projects are nominated by the UK research institutions. I think one of the great steps forward that some of the DFID programmes have made is actually investigating in considerable depth the research needs of the developing countries.

**Q154 Geraldine Smith:** Do you think the model could be extended more widely into other areas of importance in developing countries?

**Professor Rothschild:** I have to be honest and say that I do not know enough about the initiative to comment.

**Dr Poulter:** I think the principle of the initiative is a good one. Again, I think the concept of research with the north in the lead could be questioned and that is something which could be addressed. The model of linking north and south has to be a good one.

**Dr Brown:** I would say that if it is going to be one that encourages forestry and agricultural research, it needs to be done very urgently. The UK has formidable research capacity in biodiversity research, and we have a small and very rapidly dwindling research capacity in forestry and agriculture. This model will only work if it is implemented with great haste.

**Q155 Mr McWalter:** We have heard something about perhaps DFID's inability or unwillingness to think strategically. You have referred to this. It just feels to me as if you guys are sitting there waiting for them to decide what you are going to work on, and if it happens to be in your area, then you work on it. Do you not ever get to the stage of thinking that if there is to be strategic thinking and it is not happening, you must find some way that you yourselves would try and influence that so that the programmes that they did regard as central are actually programmes that you yourselves thought of as addressing the important issues?

**Professor Rothschild:** I would say that the groups that I am familiar with have been trying terribly hard to do that.

**Q156 Mr McWalter:** They have been trying and failing?

**Professor Rothschild:** It is too early to say because there is not a research strategy there. We are told it is still coming. Those who were asked to put in submissions, to interact for example with the Head of the Central Research Department, as it now is, and others, have done their darndest to do that.

**Q157 Mr McWalter:** Who are "they"?

**Professor Rothschild:** For example, they are the programmes that I represent, the heads of the various institutions who are engaged in research.

**Q158 Mr McWalter:** You have been writing long, pleading letters to DFID, have you, saying "Come on, get our act together"?

**Professor Rothschild:** I think a huge amount of stuff has gone in, not least the 600 ideas that they called for towards the tail-end of last year.

**Q159 Chairman:** Where is all that literature?

**Professor Rothschild:** That is a good question. Certainly, in terms of the themes, and no doubt DFID could advise you on that, as I understand it, there were a number of papers with themes which were issued and DFID then called for a response to those themes. Also, a paper was prepared for consultation by DFID for the All-Party Group on Overseas Development organised in January with Hilary Benn called "Agriculture, unlocking the potential". At the tail-end of that there was a section which had five points and they said, "Let us use these as a basis for further consultation and please do put in your comments and whatever else you can do to advise on where to go next". That is part of a participatory process.

**Dr Poulter:** I think the relationship between the UK's science base and DFID has been mixed over recent years. It would be true to say in general terms that the chemistry of the relationship has not been good.

**Q160 Mr McWalter:** Do they not think you are sitting in your ivory towers just doing some comfortable research on long-term projects with quite copious amounts of money and you are not really interested or connected to the problem areas, so they will chop you and see what happens? Have you seen that?

**Professor Rothschild:** Most of these folks have been out in the field actually working in third world countries.

**Q161 Mr McWalter:** I am not saying their perception is accurate. I am asking if that is not your feeling, that that was their perception?

**Dr Poulter:** There are different perceptions in the various parts of DFID overall. The point I was going on to make, if I may, is that I have also been quite widely involved with the issue on an EU basis. There has been a move over the last five years to develop a European approach to this in the form of a Forum of researchers in the EU overall, and there are individual Fora in each of the countries, or in many of the countries, involved. We have tried very hard to establish a Fora in the UK. I think it still exists in name. We were not able to get any minor seed funding at all to maintain this initiative. I think that is another area where there is a fragile, fragmented, short-termism approach to the science base in the UK. We are all struggling to keep ourselves together.



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**Q162 Mr McWalter:** How angry do you feel about that?

**Dr Poulter:** I feel sorrow rather than anger.

**Q163 Mr McWalter:** I got the impression possibly, Dr Brown, that you feel angry?

**Dr Brown:** I think there is a great deal of alarm, both amongst UK research institutions and also among many of our developing partners.

**Q164 Mr McWalter:** Is the alarm for their own jobs and futures? What is the alarm for?

**Dr Brown:** There is alarm that this whole process of the review of the research strategy is taking place behind closed doors with very little consultation with many of the actors who have enormous experience in this whole process.

**Q165 Mr McWalter:** We are alarmed because we think that possibly science and technology has a huge amount to do for poverty alleviation and the mitigation of unnecessary death on a large scale throughout the world. That is why we are doing this inquiry. We would like to get a feeling there is some anger coming from the people who have the expertise to address these matters. It just feels, in a way, as if your batteries have run down and you have not recharged them.

**Professor Rothschild:** I think there is anger. It is just that we are trying our best to be moderate people.

**Q166 Chairman:** Please do not be moderate. Come on.

**Professor Rothschild:** If you can say in these four walls "Let it all hang out", I think there is considerable anger. I come from Australia. I have been dealing with the same sorts of things, looking after a similar organisation that went through the same process; this is nothing unique. One of the sad things is, of course, and it is part of the problem, that within DFID itself the number of technical people has been greatly reduced. They do not have even a part-time scientific adviser. The number of technical people to link up with has been eroded.

**Q167 Mr McWalter:** In fact, I was right when I said there is a lack of understanding in DFID about the role that science and technology can play in alleviation of poverty? Was I right about that? The fact that they can do that suggests either that they have a lack of understanding, a lack of policies, a lack of leadership, a lack of focus, or they have got insufficient numbers of people doing it all. Is that not the nub of the problem? Is that true?

**Dr Brown:** We are outside the wall, so we do not know. Essentially, we do feel a sense of outrage that, in a sense, the only way in which we have been consulted in this process was to ask for our big ideas; 85% of those came from UK research institutions. Essentially, this seems to us to be a backwards step in the whole process.

**Mr McWalter:** You have been asked, but for instance the engineering community, as far as I can see it, has not been asked at all because they are not normally in the loop. Who is deciding who to ask?

**Dr Iddon:** Who is calling the shots in DFID? That is what we want to know. Who is making the policy decisions? Is that the politicians or the senior civil servants? Who is coiling this out? That is what we want to know?

**Q168 Chairman:** We will have them in front of us if you will tell us.

**Professor Rothschild:** I would say it emerges from the senior management. Obviously those within the DFID would know what goes on. With the current complete reorganisation and state of flux, it is somewhat difficult to know who is making the decisions.

**Q169 Paul Farrelly:** It seems pretty clear that you feel variously pretty much disengaged from the new strategy. How do you feel in your particular areas of expertise that the views of developing countries themselves have been taken into account in the review?

**Professor Rothschild:** I do not think they have been taken into account anywhere near adequately. For example, of the 600 ideas, which have now been reduced I understand to 30 or so, in the process of getting to that point, there was no engagement with partner countries in the third world. I think the ideas have had to be shown to them but they were not involved in that debate at all. That contrasts with many of the programmes which have been running for some time, which have all had to be demand-led and that was part of it. The agenda has to be decided.

**Q170 Dr Harris:** On a completely different subject, I have one question: we have had evidence from the Nuffield Council of Bio-Ethics. For my colleagues, that is evidence paper 75. They say about GM that the freedom of choice to farmers in developing countries is being severely challenged by the agricultural policies of the EU and developing countries might well be reluctant to approve GM crop varieties because of fears of jeopardising their current and future export markets. To those of you with expertise or knowledge in this area, do you feel that there is a policy issue for the UK Government and the EU about being more open-minded about this because it is closing down options for technological change which might aid developing world countries?

**Professor Rothschild:** As I understand it, the DFID does have a policy on GM, which is in fact to use the technology if it meets the various bio-safety regulatory requirements that are deemed to be appropriate and provided it does something to help alleviate poverty. That is as I understand the current DFID thinking on that. In that sense, in terms of the programmes that I am familiar with, in fact there is work going ahead on genetically manipulated crops in particular, but what they have to take into account is whether the countries in which they do this work have regulations in place which allow them to do that, but there is nothing saying they ought not to do it.

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**Q171 Kate Hoey:** I take it all three of you think there should be a full-time Chief Scientific Officer in DFID? You talked about a part-time officer.

**Professor Rothschild:** My own feeling is that if they do not want a full-time one, then a part-time one is better than not having one at all.

**Dr Poulter:** I think that is quite important. We are talking about the breadth of these issues; they are not black and white issues. It is neither yes or no, agricultural research or not. There is a debate, to be fair, in terms of the value for money, how you get to the very poor, *et cetera*. It seems to me that DFID can only really interact properly in that debate by having the correct level of expertise internally. I also think that even one person could not achieve that entirely. The other issue is that the chemistry, as I mentioned earlier, between that person and the people in DFID and those who could advise him, which is people like us, has to be improved.

**Q172 Kate Hoey:** You are all being incredibly polite about DFID. Dr Brown, if you were appointed the Chief Scientific Adviser to DFID, what is the first thing you would do to make better what is clearly a breakdown in communications and in all kinds of ways between what you are all doing as very busy people and what DFID is doing?

**Dr Brown:** There are two things. First, I think I would talk to the programme advisory committees about my 10 research programmes, many of which have very good relationships with their scientists and research community in general. Secondly, I would make sure of my relationships with the other research councils so that the funding policies were clarified to make sure that there were no yawning gaps in UK funding provisions, which allow many of our important research institutes and facilities to slip down the drain.

**Q173 Kate Hoey:** Who is responsible for that not happening at the moment?

**Dr Brown:** I am not sure I am qualified to answer that question.

**Dr Poulter:** I think I agree. The Funders' Forum approach is an excellent one. There also needs to be some kind of structure to the UK science base to respond as well. That comes back to this idea, which in principle already exists, of a Forum of the science people, so that there is actually a mechanism for DFID to interact.

**Professor Rothschild:** I think you need a part-time scientist internally within DFID and the first thing that person needs to do is develop a coherent strategy as to how to manage science and technology within DFID and how to relate to other bodies within the UK.

**Chairman:** I am sorry to have to bring this evidence to a close but we have another set of witnesses waiting.

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*Witnesses:* **Professor John Lawton, CBE, FRS**, Chief Executive, Natural Environment Research Council, and **Professor John Pickett, FRS**, Head, Biological Chemistry Division, Biotechnology and Biological Sciences Research Council, examined.

**Q174 Chairman:** Professor Lawton, Professor Pickett, I was watching your body language throughout the last session, and I think you are raring to go. You look like David Beckham on a bad day; you want to get out there and flip the ball across. What do you think about what you have heard so far?

**Professor Lawton:** I thought it was guarded. I think they are scared of losing their funding if they are rude about DFID in public.

**Professor Pickett:** I sympathise with a lot of the points, but there is no doubt that the research councils that we represent take competitive bids in areas of work that are relevant to the third world, and I have competitive responsive mode grants in this kind of area, so it is possible to get resources. The main thing, however, is that DFID does not really have a scientific mechanism by which it can access the good science that is undoubtedly here and to which you refer, and it is a very good opportunity to come along here and say something about this.

**Q175 Chairman:** If you had a column to fill in about DFID, in three or four words, how would you describe them?

**Professor Lawton:** At the moment I would describe them as complacent, rather arrogant and ill-informed.

**Q176 Mr McWalter:** Do you feel there is not a scientific culture?

**Professor Lawton:** I will tell you a story. Bob May and Stephen Cox from the Royal Society went to see DFID on Thursday. I know that they went to see Suma Chakrabarti, the Permanent Secretary. The Permanent Secretary actually asked for some specific examples of the kind of grumbling we have had, and Bob raised the series of correspondence I had tried to have with Baroness Amos. Chakrabarti said, "Who's John Lawton and what's NERC?"

**Q177 Chairman:** What was the answer?

**Professor Lawton:** Bob said he would need notice of that question and he would have to look it up! But the point is, I don't mind Chakrabarti not knowing who I am but I think it is outrageous that he does not even know about the Natural Environment Research Council.

**Professor Pickett:** There is a non-scientific culture that has developed in DFID, to the extent that there is a belief that is very clear in their recent documentation that the science has already been

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done, and all you have to do is transfer the technology into the appropriate third world situation. This is not the case. There are whole areas where there are glaring gaps in the science base, yet some of that science base is present in the UK.

**Q178 Mr McWalter:** But if they do not know about you, yet you have expertise which could really be used to achieve poverty reduction in developing countries, is that not your fault? Should you not be more proactive? You are not exactly shrinking violets.

**Professor Lawton:** I am not a shrinking violet, and I agree. We have tried to be proactive. When we had the debacle over the funding for water research with an organisation called Oasis, of which the Natural Environment Research Council is a partner, I actually wrote directly to Baroness Amos explaining our concerns and asking whether I could go and see her and talk to her. She did not even have the courtesy to acknowledge receipt of the letter, so I sent it again, and nor was that acknowledged, even though under Service First they are at least supposed to say they have received the letter. It was not until Hilary Benn came in and, to his credit, did answer and has now been engaged in a dialogue. We used to have bilateral meetings with DFID. The last one was in 1999. They do not care about formal discussion at a strategic level. We have had some contacts through our staff, but rather desultorily, and I have to say I share exactly the view of the previous witnesses: it is very difficult to know who is making scientific decisions in that organisation—or not.

**Q179 Mr McWalter:** Is it your fault, John, that they do not know much about you?

**Professor Pickett:** No. I have persistently gone to DFID with areas of science which are being funded in fact by other means, through charity foundations and so on. The same is true of the John Innes Institute, who have also persistently done this. In fact, it is often embarrassing when you are working in third world countries and people say, “Oh, are you funded by DFID?” and we have to say, “Well, no, actually it’s funded by Rockefeller/Gatsby/Wellcome.”

**Q180 Geraldine Smith:** Can I ask you what you think they should be doing to improve the situation?

**Professor Lawton:** I think they need a full-time chief scientific advisor. They are beginning to put scientific people in, for example Stephen Bass, who is the senior environmental advisor. That is a good move, but they need a full-time scientific advisor so that we have a serious point of contact. Then there is a whole series of quite creative and interesting things one could do for relatively modest amounts of money. There is a gap between the science that research councils do and the development needs, and to a degree, those research councils like BBSRC and NERC who have institutes can partly fill that gap. The Dutch, for example, have

a wonderful thing called the Netherlands Development Assistance Research Council. They have a budget of US\$ 150–200<sup>2</sup> million a year, and they use that to fill that development gap. It is very specifically targeted money, and I think it could work very like the Darwin Initiative. With respect to the previous witness, it is not true that the ideas in the Darwin Initiative come from the UK. They do not; the ideas have to come through the developing nations. Actually, if you had a fund of about £20 million a year with an organisation like the Netherlands Development Assistance Research Council, you could do a whole series of things over and above biodiversity research that would be enormously valuable in translating the scientific knowledge we have into real, practical solutions for people, and I would like to see something like that established. Somebody is going to have to take the lead, and I think that it really ought to be DFID actively taking the lead, working with the research councils, working with the British Council, working with other bodies like that and actually forming those kinds of partnerships. Then one could do split PhDs so students spend part of their time in the UK and part of it back home, split MScs and so on and so forth. You could get some creativity in there and actually do something, instead of sitting around and drilling holes for wells.

**Dr Turner:** It seems to me that there is a role for research councils here. DFID clearly do not seem to have the expertise within themselves to be an intelligent client of scientific research. This is surely a job which Research Councils UK should take on,

<sup>2</sup> *Note by the witness:* This figure was taken from the website of the **Netherlands Development Assistance Research Council (RAWOO)**. It has since been clarified that the figure is based on an assessment, made in 1996, of the development-related research activities funded by the Netherlands Government under its ODA criteria. These funds are administered by the Ministry of Foreign Affairs/DGIS and by several intermediary organisations. RAWOO was established by the Minister for Development Cooperation, and also advises the Minister of Education, Culture and Science, and the Minister of Agriculture, Nature and Food Quality. Its job is to make recommendations regarding how research that is funded by the Dutch government for the purpose of fostering development can best be attuned to the needs of developing countries. RAWOO’s principal tasks are: (1) to issue recommendations regarding research priorities and to put forward proposals for long-term research programmes, and (2) to foster communication among the various parties involved in research for development: researchers, policy-makers and end users, both in the South and in the North. The Council’s field of activity is described as “research that is of relevance to the developing world”. Research can be in any field. The only requirement is that it is relevant and useful to the developing countries. RAWOO’s annual budget for its council and advisory activities—including eg participation from developing countries—is around EUR 350,000.

Part of the Dutch development research budget is administered by the **Netherlands Foundation for the Advancement of Tropical Research (WOTRO)**. This multi-disciplinary funding organisation has a mission to fund high quality scientific research in tropical regions, with emphasis on societal relevance. Responsibility for WOTRO lies with an Executive Board and a number of programme and advisory committees. Its annual budget from the Netherlands Organisation for Scientific Research (NWO) and the Ministry of Foreign Affairs is about EUR 7 million.

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and either do as you have obliquely suggested and set up a specific council for the purpose, or designate one of the research councils, or perhaps a joint arrangement between BBSRC and NERC, who would seem to be the obvious two, to set up an international development science programme area that can deal with this specifically.

**Q181 Chairman:** Before you answer that, you are criticised for not wanting to take on interdisciplinary work or anything of an applied nature. That is said of your organisations. Is that true?

**Professor Pickett:** Our remit from the OST for both research councils is to fund excellent internationally competitive science. There is no doubt that we do fund science in the appropriate areas. Obviously, there needs to be the link from those areas into the third world situation, and we would choose the DFID route if we could make the contact with it in a more effective fashion. We know that we have the right science, because it is picked up by other agencies, like Gatsby, Wellcome, Kirkhouse Trust, Rockefeller, World Bank, so we know we have the stuff that will go out there, but we do not have the mechanism because of this culture in DFID of not seeing that there is a need for science and not accepting that there are scientific solutions to many of the problems that we have in the third world at the moment.

**Q182 Dr Turner:** But you as research councils are in a position to give a lead. There is a precedent for it in the Energy Programme, which is cross-cutting across research councils. What is to stop you, as research councils, designing a programme, taking it to DFID and challenging them to join in?

**Professor Lawton:** With great respect, we do just that, and we have been doing just that—not only in standard blue skies responsive mode research; there we still fund work that is highly relevant to development—fisheries, for example—but we do most of it through our institutes, because that is a much more effective way of technology transfer. With water, with the geological surveys<sup>3</sup> and so on we have been trying to get into DFID with those ideas and there is simply nobody to talk to.

**Professor Pickett:** The BBSRC has a crop science review at the moment, and DFID came along to that on 12 March. We hope something will come from that.

**Q183 Dr Turner:** That is overseas, is it?

**Professor Pickett:** Yes, but without this wish to see science as the solution, and without their strategic plan for how it is going to be used to the benefit of the third world, it is quite limited as to what we can expect.

**Q184 Chairman:** Did you ever seek a concordat with DFID, either BBSRC or NERC?

**Professor Lawton:** We had a concordat until 1999. After that we had one of the senior people in DFID sit on our Science Strategy Board, and therefore

Andrew Bennett decided that since relations were so good we did not need to review the concordat, and that was the point at which the formal bilaterals lapsed and which we have never been able to get back in. We have had relatively recently rather modest contacts through staff. If a concordat would make a difference it would be great, but both organisations have to want it; it takes two to tango.

**Professor Pickett:** I absolutely agree. The funders' forum, of course, would be a way of helping but, again, it is not the end of the problem once that is created, because we need to have this matching partnership, an incentive to see science as an opportunity to solve problems in DFID, as well as their being on the funders' forum.

**Q185 Dr Iddon:** I was going to ask about that forum a little later. As I understand it, there has recently been established an environmental research funders' forum, of which I think, John, you are the Chairman, so it would be appropriate to ask this question now. Can you tell us a bit more how ERFF works? Is it effective? What benefits has it delivered so far? How might the idea be applied to the international development research programmes as you have just indicated?

**Professor Lawton:** I have actually written to and invited DFID to join the environmental research funders' forum but I have not heard back from them yet.

**Q186 Dr Iddon:** When did you invite them?

**Professor Lawton:** About three, possibly four weeks ago, and again, I have not had an acknowledgement of that letter.<sup>4</sup> The environmental research funders' forum is a grouping of the main funders of environmental research in the UK: NERC, the Environment Agency, DEFRA, the Scottish Office and so on. It is not a talking shop; we set it up to try and make sure that there was no unnecessary duplication or overlap in what we were all doing or funding and so we all knew what we were all doing and funding, because we did not actually know properly. We undertook a major survey of the environmental strengths and weaknesses of UK environmental science broadly. That was the first thing we did, and we are now using that to address where there are strengths, and where there are weaknesses do something about it. We are putting together at the moment a major review of all the environmental monitoring that goes on in the UK. There is no central database of environmental monitoring in the UK, and there ought to be. So it is trying to do things. It has a small budget and a small number of dedicated people working on it. I would very much welcome DFID being at the environmental research funders' forum, where they would be able to bring to it their views about what the priorities are for research, not just in the UK, obviously, because environmental research is global, and if they were to join, I would very much welcome their input. But they have not yet agreed to join.

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<sup>4</sup> *Note by the witness:* The invitation was in fact sent on 2 March 2004 and a reply has now been received (on 17 March).

<sup>3</sup> *Note by the witness:* Through CEH and BGS, respectively.

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**Q187 Dr Iddon:** So you see ERFF having a role in technology transfer, training and capacity building?

**Professor Lawton:** Very much so.

**Q188 Paul Farrelly:** Professor Lawton, you actually pointed out the Netherlands as one example of what you might call best practice, and Professor Rothschild mentioned Netherlands in another context. On this question of untying of aid, could I ask you how these policies have affected your institutes and the sorts of research that you do, and whether you have spoken to DFID—although the answer to that seems self-evident—and also could you pick up on Professor Rothschild’s intriguing suggestion that DFID might be more sophisticated in its de facto implementation of untying of aid in discriminating between different situations.

**Professor Lawton:** Let me just preface my comments. I am not making a special plea for NERC to get any kind of inside track or funding. That is not the name of the game. I am just concerned to make sure that scientific information is delivered to where it is needed. If they choose to get that scientific information from bodies outside the UK, and they can win the contracts fairly and squarely, fine. I do not have any axe to grind on that. In terms of NERC, over the last 10 years in headline terms DFID was funding the two main technology transfer centres within NERC, the British Geological Survey to the tune of £6 million a year, and the Centre of Ecology and Hydrology to the tune of £3.5 million a year 10 years ago. Those investments have now fallen to less than £0.5 million each, so they are simply not tapping into that expertise. Does it matter? Yes, it does. At the moment, for example, the emphasis on poverty alleviation is leading to a very large number of wells being drilled in a whole series of developing countries. Many of those are being drilled by voluntary organisations, without the faintest idea about the geology of the groundwater, the recharge rates and how you could damage the aquifer if you drill holes in it. So you have this bunch of happy people drilling holes in the ground without having a clue what they are doing in terms of scientific strategy.

**Q189 Paul Farrelly:** So the reduction has not been a change in priority or overall funding?

**Professor Lawton:** No. They are just not actually taking scientific advice about the consequences of their actions.

**Q190 Paul Farrelly:** Is DFID just being politically correct?

**Professor Lawton:** I do not know. You should ask them. At the moment they are rebuilding on the Mozambique flood plain, in an area which was devastated, without asking whether it is going to flood again, and the answer is yes, it is. It is a huge waste of taxpayers’ money. The fact that they are not getting the advice, not even asking for it, in the most elementary and strategic way I think is scandalous.

**Q191 Chairman:** How much is that waste worth?

**Professor Lawton:** I do not know. The British Geological Survey’s experts tell me that the potential damage to groundwater by random drilling of wells could be very serious indeed. You can permanently damage the aquifers and they may not be sustainable and so on. It would be easy enough to find out what the rebuilding on the Mozambique flood plain is costing, and the Centre of Ecology and Hydrology and BGS people assure me that that area will flood again relatively quickly, so you can work out what the waste is going to be.

**Professor Pickett:** On the crop protection side, the fact is that our money from DFID has also diminished, but I do not think we are really making a plea on that score. We are getting it from other agencies. The main thing is the frustration that the science base which is there is not being used, and not even being recognised. That has led to various issues which we would strongly disagree with, the use of inappropriate biological agents.

**Q192 Mr McWalter:** Such as?

**Professor Pickett:** *Bacillus thuringiensis* endotoxins are actually against lepidopterous insects and to some extent certain flies, but not the kind of insects being used in programmes that we have seen. We have seen against the fact that already a lot of resource has been put into social sciences issues where fallowing has been used to try and control weeds particularly in Africa, the African witch weed, and if you look at the economics on the ground, people really cannot afford to have this piece of land out of production for a season, or even two seasons, the two rainy seasons that occur in the year, and even the crops that have been grown do not have any value in themselves, and where the African people have tried to make value by eating them under slightly strange circumstances, the crops themselves are not really appropriate for that purpose. All this stems from a lack of scientific, measured advice and involvement within the system. But I think the idea of tapping the world’s scientific resources when we are not tapping those in the UK is very sad, because just giving the money to CGIR does not mean to say you are tapping the best of the world’s resources; they have their own problems in terms of their priorities, where they see their priorities and what they actually do with the science base that they can take.

**Q193 Paul Farrelly:** If they are not tapping your resources, are they therefore missing a trick on using you to try and build up capacity on the ground overseas?

**Professor Lawton:** Yes. If you take the British Geological Survey, I understand, Chairman, that you are going to Malawi. The Malawi Minister of Energy and Mines and the head of the Malawi Geological Survey have actually asked the British Geological Survey for advice; they are desperate for advice about mineral exploitation in Malawi. It is one of a few ways in which they are going to use science to get out of the poverty trap. They have potentially very high mineral resources. The British

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Geological Survey could do that; they have the information. In fact, they have huge repositories of information on the geology of Africa that no other nation has, but DFID will not fund BGS to help in this way. If that is not poverty alleviation, what is? It is unbelievable.

**Q194 Dr Turner:** We have had a wealth of evidence criticising DFID for failing to generate any capacity building efforts. Clearly, it is becoming more and more apparent that the capacity building really has to start at home within DFID, because if DFID does not have enough capacity within DFID's structure, it cannot possibly build anyone else's capacity. Do you agree that is where we need to start?

**Professor Lawton:** That is absolutely right. I totally agree.

**Q195 Dr Turner:** The rest could fall into place if we could get that straight.

**Professor Lawton:** If we had an intelligent customer in DFID, it would certainly be easier.

**Professor Pickett:** We agree.

**Chairman:** Do not go too far. You have a certain amount of protection, but assassination of witnesses is still in DFID's remit!

**Q196 Dr Harris:** Moving on from capacity building to the issue of training, in your evidence you explain that most councils do assist visiting students and scientists from developing countries. What about the risk that the Royal Society draw our attention to in their evidence that people do not go back and therefore it is effectively a pump priming of a brain drain? Do you have data on the people that you are funding to come over on the various schemes that you set out in your evidence to show how many people are going back with their skills?

**Professor Pickett:** Yes. We have been very conscious of the brain drain. My own institute, for example, has an international fellowship scheme, in which mid-career scientists come over on the condition that they have a job back home and that they will be expected to go back, so they have some permanence in their home country. Although we pay for their family to come so as to alleviate personal problems, the idea is that they do not move over here, and it is only for a short time, not for the full three years that might give the person while doing a PhD in the UK a greater incentive to stay or to move on to the US.

**Q197 Dr Harris:** My question was not about the principle, because I think everyone agrees the principle, but do you have audited data to show whether that is working, or whether people are, not unreasonably, tempted by, as the Royal Society put it, lucrative employment in the developed world in science, which is, I think, from their perspective?

**Professor Pickett:** I do not have my hands on BBSRC data for that, because I am an institute member representing BBSRC. We could get what data we have for you.

**Q198 Chairman:** We can deal with that with the British Council in the next session.

**Professor Lawton:** Chairman, I do not have those numbers to hand. I would say that, because of the cost of funding a PhD in the UK, we actually have very few overseas students doing PhDs here compared with many other nations which choose to do it much more cheaply. Masters courses are somewhat different. They are often paid for themselves, and I just do not know how many of those students go back home. We do, however, know that the British Geological Survey does a whole series of in-house training which leads to the issue of a certificate of competence, so people come for rather shorter periods, say six months, to learn techniques, and then they all go home to their own country, and the Centre for Ecology and Hydrology has rather similar but not so structured schemes. The Dave King studentship idea I think is imaginative and important. I must admit, all the research councils, including NERC, worry that many of those students will not go back home. We are supporting them because it was the only game in town of that kind, but I do worry that we will find that many of the students do not go back home.

**Professor Pickett:** In addition to that, of course, the self-funding nature means that you do not have quite the meritocratic system that you should really have.

**Q199 Mr McWalter:** Do other councils, such as the Medical Research Council and the Engineering Council, share your views that we do need a development research council, and would they be very strong contributors to and enthusiasts for it?

**Professor Lawton:** I did not actually call it a development research council. I said we would need a funding scheme, and I gave the analogy of the Darwin Initiative, which is not a research council. You have to have something between a funding scheme or similar development initiative, which somebody would have to run, and a development research council, which is the full-blown Dutch model. I do not have a clear view about where on that spectrum we sit.

**Q200 Mr McWalter:** Do you have strong support from your colleagues?

**Professor Lawton:** We have only talked about the Dave King studentship stuff. We have not collectively in RCUK talked about that particular scheme that I suggested—not because they are not interested; it is just not something that has happened.

**Q201 Geraldine Smith:** Going back to the Darwin Initiative, why do you think it is such a good model or undertaking in using research in developing countries?

**Professor Lawton:** The Convention on Biological Diversity, before it came into place and now it is in place, did put quite extensive demands on development nations, many often with poor infrastructure to respond. So for relatively modest sums of money, and because the ideas come from the nations themselves, it helps to build capacity in biodiversity work and particularly in biodiversity

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conservation, but also potential exploitation of those resources, and all the evidence I have seen says it is a very cost-effective way of doing the work, and the ideas flow from the developing nations themselves, and that is also really very important.

**Q202 Geraldine Smith:** Do you think it is well funded?

**Professor Lawton:** No. I would like to see the Darwin Initiative funding increased a bit. It is rising to about £7 million, which is small. I know a number of UK research colleagues who have had money in the Darwin Initiative who speak very highly of it. It was a very cost-effective way of doing things, and a number of NERC institutes have had the money and it has been well worth doing. I could not understand one of the previous witnesses who kept talking about the admin costs of these things. They are not huge, and actually, they are worth doing.

**Q203 Geraldine Smith:** Do you think the Darwin concept should be extended to areas other than biodiversity?

**Professor Lawton:** Yes. When I was talking about the equivalent of the Netherlands Development Assistance Research Council, I could see us not going to a full-blown research council necessarily, but actually extending the Darwin idea to things like hydrology, groundwater, geology projects that would be funded on a similar basis with the idea, like the Malawi request, coming from the nations themselves.

**Q204 Chairman:** I take it you are not on DFID's Christmas card list at the minute. They are developing a research strategy. Have you played any part in that whatsoever?

**Professor Lawton:** Yes. Again, let us do some contrasts. We have been very closely involved with developing the strategies of two sister organisations: the Environment Agency and DEFRA. There the consultation was proactive: they wrote, we had many meetings, and it was a very productive, constructive exchange. DFID put the announcement that they wanted consultation on their website. They did not contact us. I do not think they contacted any of the research councils proactively. We happened to blunder across it. We sent in information, but the discussions have been much less constructive and engaging than they were with the Environment Agency or with DEFRA.

**Q205 Chairman:** What would you like to see in the research strategy?

**Professor Lawton:** We put ideas in about things that needed doing. I think the most important thing they need to do is to recognise the need for a strategic engagement in the science they fund and the training they want to do, and recognise that at the highest level a strategy is pretty worthless unless it starts at that level. That would be the thing I really would like to see in it. After that, it is a matter of judgment for the individual countries that want help and the research councils and other bodies that can provide that help. That has to be debated: there is an amount

of money, you decide on the information what the countries themselves are asking for and what they want. I can pick areas in NERC science that I think should be developed. We have not touched on earth observation at all tonight, but actually earth observation has huge potential to help developing nations identify hazards, to record what happens after natural disasters and help plan the solutions and so on. So there are plenty of things you can think about doing.

**Professor Pickett:** Yes, indeed. It is the same story: marker-assisted breeding for legumes and tea would be a particular example of something that the John Innes Institute would see as being an important part of such a scientific strategy, but when you read the documentation associated with us, as John put it, stumbling across the fact that we could contribute, you see this mindset of the science being already done and that technology transfer is the crucial issue. That is not the case. That mindset has to change before we can really exploit the science that we have in this country of value to the third world.

**Q206 Paul Farrelly:** It has become quite clear that DFID having a part-time scientific advisor sends the wrong message on its approach to science. That has been quite clear from your evidence. Clearly, your relationships have tailed off, to say the least, since 1999. Why is that? Are there personnel or personality issues involved or what?

**Professor Pickett:** It is partly because of the rules by which you need to engage with them. There have been rules, and they have got more and more to the extent that we have to pay lip service to areas of activity that may not seem to the scientist as being paramount initially, and that includes this move towards increased involvement of social science. None of us have a problem with that in principle. It is the way it has this overriding impact even when there is a clear scientific driver. I think some of the mentoring approaches that exist are not conducive to the best scientists wanting to be involved. If you win a grant on a competitive basis to do some research that is appropriate to the grant funding agency's priorities and remit, you do not really need to have somebody from another organisation, who may have been an erstwhile competitor, looking over your shoulder to see whether you are doing the right kind of job. That has been the situation that has existed now for some time with the grants that there are. Maybe there is some reluctance to engage and apply for money. Certainly there is a difficulty in getting it into the right quarters. It is a combination of issues, but mainly this one in which we felt that the science has not been the central issue, that technology transfer has become the central issue, and that issues of politics, in the small sense, have overridden where the science needs to be exploited.

**Q207 Chairman:** My last question is about core funding, which they have withdrawn from UK institutions. How has this affected the working and policies of those institutes, and can you give me some examples?

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**Professor Lawton:** Yes, very easily. I gave you in headline terms the way BGS and CEH funding has gone down. CEH have lost 30% of the staff that used to work in the area of technology transfer for capacity building in developing nations. That has severely depleted the UK expertise in that area and the ability for the UK to help with these issues. The British Geological Survey has not lost any staff because it has managed to fill the funding gap by using things like World Bank funding. So they are continuing to do quite a lot of this work using World Bank funding.

**Q208 Chairman:** What did you say to DFID when this core funding was taken away?

**Professor Lawton:** That was part of the substance of the letters which I wrote to Baroness Amos.

**Q209 Chairman:** Is that letter in the public domain?

**Professor Lawton:** You are very welcome to see a copy of it. I will send you a copy.

**Professor Pickett:** It has not had so much impact in the BBSRC institutes. If my colleagues who work directly with DFID funding were here, they would say differently, but overall, it is quite a small amount of resource. Of course, it has eroded, and some quite important areas have gone with it, but I would have to get details to furnish that, but I would not say it was a major issue, because we get our resources from a lot of other areas. The fact is though that we are not exploiting them to the full, which we could do if DFID had a science policy that we could mesh in with and exploit in that sense.

**Q210 Chairman:** As ever, I hope this Committee's report will have some kind of influence anyway through the media and debates and so on. When we go to Malawi, what should we be looking for and not be shown?

**Professor Lawton:** David Ovadia within the British Geological Survey, who was the person to whom the Malawi Minister and the Director of Malawi Geological Survey were speaking, urges that you go and have a look at the Malawi Geological Survey. We can put you in touch with the appropriate people, and they can tell you what they are trying to do and how frustrating it is not to be able to get the funding through the UK. They want the UK to do it; there just is not the funding there to do it.

**Professor Pickett:** I do not have an example from Malawi. I have an anecdote. We were actually out there building a new programme related to programmes in other parts of Africa on a small grant from a Swiss charity, and all of our own people—that is, the farmers and the people from the Ministry and the extension services—were whisked away for some kind of DFID programme in which very, very small bags of seed and very, very small bags of fertilizer were being given out, and this seemed to be a totally unsustainable and non-scientific based piece of development work which you would not really expect of an organisation that DFID should be.

**Chairman:** I think we have heard enough about your accolades for DFID for one night. We take it very much to heart and we will be following up in our subsequent hearings and our trip to Malawi. Can I thank you both for enlightening us in this area. I am sure you have sharpened the Committee to some degree. Thank you very much.

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**Monday, 26 April 2004**

Members present:

Dr Ian Gibson, in the Chair

Paul Farrelly  
Mr Robert Key  
Mr Tony McWalter

Geraldine Smith  
Dr Desmond Turner

*Witnesses:* **Professor Sir David King**, Government Chief Scientific Adviser, Office of Science and Technology, **Ms Fiona Clouder Richards**, Head of Science and Technology, Foreign and Commonwealth Office, **Dr Lloyd Anderson**, Director, Science, British Council, and **Dr Peter Tibber**, Group Director, International Sectors Group, UK Trade and Investment, examined.

**Q211 Chairman:** Good afternoon. I thank our witnesses for coming here today to help us with our inquiry into the use of science in UK international development. Can I start by asking you why your department contributes to training people from developing countries. What is the purpose, would you say, in a few brief sentences?

**Ms Clouder Richards:** In terms of training, our schemes are focused in terms of the FCO strategic priorities. All the work we are doing with both developed and developing countries is meshed into that priority framework. We have three main training schemes. First of all we have our Chevening scholarship scheme, which has recently been reviewed. We are also working, with DFID support, for Commonwealth fellowship and scholarship schemes,<sup>5</sup> and also we have the Marshall scholarships with the US. These three schemes are important vehicles for the FCO. We are also, following the Chevening review, looking at how we interface with other government departments. We have proposed to other departments that we convene a stakeholders' forum, where we can share best practice on management of the different scholarship schemes, explore scope for synergy, improve management, improve marketing of those schemes, and follow up. They are important mechanisms in developed and developing countries, where we can use those schemes both to build capacity in terms of manpower, and also as a route for future influence in that country.

**Dr Anderson:** The British Council, as you know, is the UK's international organisation for cultural relations and education. The purpose of the Council is to build mutually beneficial relationships between people in the UK and other countries. Therefore, within that purpose a large part of our work is to bring students to the UK for training and further education. We have a large education sector involved in that. Within the science sector, we promote collaboration between young scientists overseas and in the UK and we have a number of schemes to bring people together. We see the whole effort as being about increasing capacity in the country and being able to help those countries develop, and to promote the UK internationally.

**Q212 Chairman:** What has it brought to the UK? What would you say is the power of it all? How would you gauge it and point us in the direction of successes?

**Ms Clouder Richards:** I think the Chevening review recognised that we need to get much better at assessing the impact and that we should follow through on that. That is part of the rationale for the review and its follow-up. In terms of benefits, it is both about training and manpower in those countries; it is about building relationships between the UK and the countries of origin and all their students, and it is also about influencing the type of training that can help in future capacity-building in those countries. In terms of the selection criteria, we are very much looking to take the best students, and our priorities at the moment are not country-driven. We are looking at selecting the best people for those training awards.

**Q213 Chairman:** How would you describe your interaction with DFID?

**Ms Clouder Richards:** It is generally a productive one. In terms of these various training programmes, for example the Commonwealth Scholarship Scheme, that is a joint partnership with DFID. There have been regular discussions with DFID on how those schemes should shape up and future priorities following the review.

**Q214 Chairman:** Where do the bright ideas come from? Is it because of these meetings? Who drives it?

**Ms Clouder Richards:** In terms of selecting the students, that is done in-country, and the British Council manage the scheme in the country. Lloyd is better placed to answer that than I. The review was done by an independent consultancy that obviously took views from the FCO, from DFID and from other stakeholders in Whitehall and beyond.

**Dr Anderson:** We manage both the Chevening scheme for FCO and we also manage the Higher Education Links Scheme for DFID. I would like to mention the Higher Education Links Scheme first because that is very much about capacity-building by linking HEIs in the UK and overseas. DFID put about £3 million a year into this scheme, and if you take the contribution by the higher education institutions in the UK and the British Council, it adds up to over £10 million *per annum*. There are

<sup>5</sup> Note by the witness: Commonwealth Scholarship and Fellowship Plan.

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priorities, but those are priorities around the country that the scheme takes place in. As to subject area, that is very much a bottom-up decision of the higher education institutions in the countries. I think the Higher Education Links Scheme has been very successful, and all the evaluations that have been done over the years have shown that it has been able to promote partnerships, to bring departments together to facilitate capacity-building. The Chevening Scheme is a scholarship scheme and therefore it is very much about bringing people to the UK for a period of training and then they return to their countries. Again, those schemes are evaluated by the British Council. Both are important mechanisms to promote capacity-building in a country. The nature of co-operation has changed, and when you go overseas and talk to foreign governments, it is very much about symmetrical co-operation. The feeling is that there is something to be learned from both sides. If you go to Brazil, you have to say, "you have as much to learn from us as we have from you". That is why I emphasised at the beginning the idea of a mutually beneficial relationship; and I think it is no longer about simply sending out experts or people going on visits.

**Q215 Chairman:** We will come back to the Chevening programme with more detailed questions. David, do you want to add anything?

**Professor Sir David King:** For completion, I ought to mention the new Dorothy Hodgkin Award Scheme, which is a PhD studentship scheme that adds on to the schemes that have been mentioned and was initiated and now run through the Office of Science and Technology. It is in its first year of operation. We aimed to achieve targeting the top group of most excellent students from abroad to come to our top departments of study for a period of three or four years to do PhDs. We would anticipate that this would have multiple benefits. A period of PhD would benefit the UK, in terms of the science being done by the people concerned. We would anticipate 90% approximately returnees, which would then benefit in terms of capacity-building in their own countries, and the 10% who stay would benefit both our own economy and their own economy through continued networking that would develop through them.

**Q216 Geraldine Smith:** How do you encourage students to return to their own countries afterwards? You said there was a 90% return rate. Are there any contractual arrangements that would ensure they would return?

**Professor Sir David King:** No, we do not place any contractual arrangements. The 90% figure return rate is based on the current practice. This scheme may throw up differences of course. I am certainly not in favour of attempting to provide a contractual requirement for people to return to their country, not because I am not trying to achieve maximum capacity-building because that is the objective, but I do not believe that that is compatible with the general policies of this Government, and nor should it be.

**Q217 Chairman:** Why not? Why do you not set up this kind of relationship?

**Professor Sir David King:** That is a very big question. The answer, as I see it, is that we need to integrate objectives. Some of our objectives concern wealth creation in the United Kingdom; others concern capacity-building. Different departments of government have these different objectives, and I do not believe that these objectives are contradictory. It is perfectly possible to fulfil these objectives.

**Q218 Chairman:** I think we are going to have some sharp enjoiners over that question later because that seems to be the nub of the question.

**Professor Sir David King:** Yes.

**Q219 Paul Farrelly:** What do you individually think of levels of funding for the costs of training developing country students in this country? One example is the Pakistani government's complaint that it can train four PhDs in some countries for the cost of training one here. If you recognise that that is a legitimate issue, how should we be addressing it?

**Professor Sir David King:** The schemes we have been discussing are fully funded schemes to attract students from developing countries at the cost of the British Government. As a matter of fact, the scheme that we have initiated, the Dorothy Hodgkin, is part funded by industry and part funded by the Research Council. Nevertheless, your point is one that we need to address in terms of the differential between home-based fees and foreign students. I believe that it is critically important to get across the message that this country is perhaps the most outstanding place to be exposed to high-quality science. Our science base is extremely productive compared with any around the world. I am not suggesting that this should be used as an argument to retain large differential fees, but nevertheless it is a strong argument.

**Dr Anderson:** The British Council last week published *Vision 20/20* which forecasts international student mobility. The numbers of students coming to the UK is set to rise quite remarkably. These are students who are paying for themselves, so clearly they see value in coming here. The figures are very impressive, and the figures from China and India have gone up hugely since 1998 from 3,000 then to 32,000 in 2003. I think that students see the benefit of coming to the UK and getting a UK education. As Sir David said, that is quite a separate thing from the schemes for higher education, like Chevening, which are financed differently.

**Ms Clouder Richards:** You raise a very important and valid point. We should not be resting on our laurels, assuming that the UK is the obvious choice for overseas students. However, there is an important factor that here we have a window of opportunity with the changing policy in the US, that more and more overseas students who are looking to train in an English-speaking country are now looking to the UK, whereas previously they would have gone to the US. There is a window of

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opportunity for us to capitalise on. Sir David makes an important point about projecting and strengthening of the UK, and that the UK provides a quality training environment. For the FCO, work through our new science and technology network is a very important vehicle in helping to project that image of the UK overseas. The issue you raise of differential fees and the impact they have relates to issues of value for money and how to best deploy our funding, and about the impact we get from those students we fund. Those will all be issues that we will be looking at in relation to the Chevening review.

**Q220 Paul Farrelly:** The Committee has received evidence of the way the funding works, and it seems to be skewed towards masters courses rather than PhDs. If that is correct, why is that—or do you think we have got the balance right? If not, how would you change it?

**Ms Clouder Richards:** This is an issue that we and other partners are looking at. Historically, Chevening has been very, very heavily focused on masters, but it is not true that it is exclusively masters. There has always been some scope for PhD funding through that route. Again, as part of the review we are looking at the balance. A driver for this has been the numbers game. Thinking about our posts overseas, they have to look at how they can have the most influence in a country, and obviously the more people they can get through Chevening or other routes, they would see as a very positive thing. As we move on in Chevening—and I mentioned this best of the best selection process—we would be looking to work with posts to identify the absolute top level people, the young professionals, leaders of the future, and focusing on what is the best training vehicle for those people. If that is a PhD, then there will be three years of funding to follow that. In terms of the numbers game, there was a Prime-Ministerial initiative to increase the number of Chevening scholars, and that in itself has been a driver. If you get more people through that, it ups the numbers. Again, this is an important policy that we will be looking at. There is also complementarity with the Dorothy Hodgkins that OST has initiated.

**Professor Sir David King:** I would like to add to that my own experience with foreign students. I would say that with any students coming from almost any other country to this one, experiencing a change in culture, it takes more than a year to settle in. The really steep learning curve occurs 18 months in. The adaptation to our cultural patterns and a shyness when faced with the self-confidence of people operating in their own cultures are major problems in that first year for almost every student I have had from abroad. The value therefore in having a three to four-year scheme in my view is considerably more than four schemes of one year, in terms of what the person returning takes back from their experience in the UK, both in terms of the learning experience in science, but perhaps more especially in terms of the understanding of the culture.

**Dr Anderson:** The figures for numbers of postgrads in the UK in 2003 was 112,000 as opposed to 126,000 undergraduates, and of those 112,000 postgrads

35,000 were doing postgraduate research, and the other 27,000 were doing postgraduate taught courses. The major area of growth is in the postgraduate taught courses not in research.

**Q221 Paul Farrelly:** What is your opinion on that?

**Dr Anderson:** I think most people are happy to come for a year. I think three years is quite a commitment for a lot of people.

**Q222 Chairman:** In the 1980s there was a great cutback in the British aid programme. Can I suggest to you that maybe now we are trying to recover from that? It may have been before your time. Is that what it is all about deep down, that we are trying to recover the ground we lost in the 1980s?

**Professor Sir David King:** I think you are putting your finger absolutely on a very important point, except that I would take you even further back than that, Chairman. In the 1960s the differential was introduced, and that was the time when we saw the big switch from PhD student country of origin in the UK. If you now travel to India, you would find the difference immediately, in talking to people of our age, Chairman. They were often trained as PhD students in Britain. The younger generation trained in the United States. We lost a potential edge in those countries, I believe, through the introduction of differentials. We would like to recover that situation.

**Q223 Geraldine Smith:** Is there any data available on the number of people from developing countries training in this country, and what happens to them when they have completed that training?

**Dr Anderson:** In terms of international students, we have figures by region, so we can say how many are coming from Africa. In fact, at the moment 19,000 students come from sub-Saharan Africa. In terms of the numbers of returns, I do not think there are figures because not all international students are tracked. In terms of the Chevening and Higher Education Links Scheme, we do track those because we keep alumni records, so we know that about 80% return.

**Q224 Geraldine Smith:** What about the Dorothy Hodgkin postgraduate scheme? You mentioned 90% return. Do you have data for that?

**Professor Sir David King:** The scheme takes the first students in in October this year.

**Q225 Geraldine Smith:** So you are anticipating 90% will return, but will data be held?

**Professor Sir David King:** We will try and keep data, yes. It is quite difficult to track people once they have left the country. Some of them may return and we lose track, but we will try.

**Q226 Geraldine Smith:** Do you have any evidence that there could be a possible brain drain from developing countries if we are taking people and training them, and we are not quite sure how many return? Are we doing a disservice to some of those countries by keeping some of their best people here?

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**Dr Anderson:** With the British Council's schemes, the great majority do return, and we are able to track them when they come back to the country. There is always the risk of a brain drain. There was a conference in Brussels recently that was about "Europe needs more scientists". In fact, we need 700,000 more scientists in Europe by 2010. The problem is, if you look at the drop-out rates at universities across Europe in sciences, it is high. If you look at surveys of 15 year-olds, they are not interested in doing science. Where are these scientists going to come from? They are going to have to come from third countries so the [European] Commission is looking to third countries as a way of supplying scientists to fill the gap in Europe. The problem with that is that you are not addressing the core problem, which is how to get young people in Europe turned on to science and to become scientists, because that is the sustainable solution. The answer is not to say that we will find them from third countries.

**Q227 Geraldine Smith:** Is it also not ethically wrong to do that, to take them away from their own countries?

**Dr Anderson:** It goes back to the point I was making about symmetrical co-operation. When I have been in other countries, they are very clear that they want to be a part of the knowledge economy, and therefore they want to be generating new knowledge, and they want their skilled people. So whereas in Mexico they were quite happy to send people for three years' study in the UK, they are no longer prepared to do that. The most they will let them go for is a year, and they want them back because they want to grow their own base to address the demands and needs of the knowledge economy. They are prepared to have them go for a period of study to get the skills, but they also want to bring them back.

**Professor Sir David King:** We might not all sing from quite the same hymn sheet. I would not want the situation to turn into the sort of situation that the United States has been organising itself into since the second world war, where the engine of their science and technology development has been people coming to the United States from Europe, but also much more recently from China and India predominantly; and the return rate of Chinese and Indians from the United States is more like 20%; the figures were the other way round. I would never want to argue for that, but I do not think there is harm in a situation with a figure of around 80–90%. In talking to members of the Indian and Chinese governments about the Dorothy Hodgkin Award Scheme, they too were quite satisfied with that sort of number. There is the understanding that people who stay in our economy often later on return with a much greater knowledge base of how our economy operates, and return to high positions in their society. Moreover, many of those people retain very close links with their country, and that sort of networking that they set up with their countries is extremely valuable to the country back home. As I say, I am not favouring the kind of system that the United States is following.

**Q228 Mr McWalter:** One could get clearer on how that slight dispute could be reconciled if one looked at the actual research projects that people are being asked to do. There was a very impressive representation to us by Alec Gaines of Strathclyde University. He says: "Insufficient attention is paid in Britain to providing students from developing countries with research problems and training that can be extended by the students when they return home." They come here and go to University College, London, and do work in cryogenics or whatever. Then what do they do—go back to a place where they are never going to do any low temperature physics ever again; or do you stay here because your expertise is in area where the only expertise is here? You have to ask yourself the question: is Alec Gaines right to say that basically we have got things structurally wrong here in terms of managing this relationship to the benefit of developing countries?

**Professor Sir David King:** This is a much more complicated question than indicated by that scenario.

**Q229 Mr McWalter:** If I may say so, I only had a minute to ask the question! I can go on, if you want me to!

**Professor Sir David King:** I was not intending to be critical. If you take, for example, India and China as reasonably good models for countries developing, with economic development rates of 8–10% *per annum*, which I take to be rather good; I believe that derives from the fact that their operation in science, technology, engineering and medicine is holistic. In other words, both of those countries have attained a very sophisticated level of educational system, starting from primary school, going through to university and going on into research institutes. I do know that in each of those countries cryogenics research for example is in quite an advanced state. I think that those very high achievers who do research of that kind are necessary for the challenging development of the whole system. If you are going to develop teachers of the highest quality, you need universities that will challenge people to produce people of the highest quality, and so on, all the way through the system. I do not believe that a system can successfully operate in any country if we suggest that there should be some kind of cover. However, there are areas of research that are enormously expensive to pursue, and I am not sure that I would pursue my own argument if you had said particle physics, for example.

**Q230 Mr Key:** Sir David, with the best will in the world, what is the point of a three-month Chevening fellowship in science?

**Professor Sir David King:** There can be a point where there is a very clear programme of learning that needs to be done; but I suspect that you and I would agree that a longer period is really required to maximise the benefit.

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**Q231 Mr Key:** Now that the FCO is asking you in the OST to co-fund Chevening in recognition of “the outcomes achieved by Chevening for British science and technology” you will not be very impressed by that overtone.

**Professor Sir David King:** The side of the operation that Fiona Clouder Richards referred to, that we are very sympathetic towards, are the PhD schemes.

**Q232 Mr Key:** There was only 6–6.5% in 2002–03 of all new Chevening scholarships awarded in science and engineering, so what do you think the benefits are for science and technology for the UK apart from those PhD schemes you have mentioned?

**Ms Clouder Richards:** Amongst our data, we do not have the details of how many of those 156 awards are for three months or one year. I can certainly try and find that information for you, if that would be helpful. I would assume that a very large proportion of those awards would be for one-year masters, where you have a specific training programme in an area of science that will benefit that student. In terms of the criteria by which Chevening awards are made, they were not being assessed in terms of—it is not a science and technology programme; it is looking at the training that is needed and the relationship with the country that has been built up.

**Dr Anderson:** The British Council manages the programme and we can give the statistics.

**Ms Clouder Richards:** I wonder if there is some confusion here as well. Under this review of Chevening, there is a new element being introduced, which would be a three-month fellowship. That is not within the original 156. That is again a broader development of Chevening, and there is to be a pilot scheme over the next year where the impact of that mechanism will be assessed. In future years, we will be looking at what that might mean in the science and technology context. That is not in place at the moment in relation to science and technology.

**Q233 Mr Key:** Why did DFID withdraw from participating in the Chevening scheme? Until 1998–99 DFID sponsored Chevening scholarships for students from developing countries and then they withdrew. Why did they withdraw?

**Ms Clouder Richards:** That is not a question I am qualified to answer.

**Q234 Chairman:** Who is qualified?

**Ms Clouder Richards:** DFID, one would assume, but I can also write to the Committee with further information.

**Professor Sir David King:** If I may comment more broadly, DFID did tend to decide to act independently of other Government departments in its international development work.

**Q235 Chairman:** Can you elaborate on that a little? It is quite a startling thing to say even for you, Professor King!

**Professor Sir David King:** This is a very important point, if I may elaborate at some length? We are conducting a detailed scoping study in the Office of Science and Technology on capacity-building and

science and technology. This began a few years ago through my own interest in OST capacity-building, and I attended the WSSD meeting. As a follow-through to that we began the scoping study. A very positive thing I can report is that DFID has now agreed that they can join us in completing that scoping study. What emerges in that study is a number of things, but in particular this question of examining the interests of different departments of government in their relationship in science and technology with other countries. If we take the Foreign Office, clearly diplomacy is critically important. In the DTI, wealth creation for the UK is important. For the Office of Science and Technology’s science and engineering base, the health of British science is critically important. DFID is engaged in international development. As I have already indicated, our scoping study is beginning to emerge with the notion that you can pull all of this together. You can integrate policies. I think it was possibly justified to separate out international development from other policies within government in the past, but now that international development has a clear agenda, we can easily bring in these other agendas.

**Chairman:** We are going to feature this prominently in the next session.

**Q236 Mr McWalter:** I was very pleased to hear that, Chair, because it is what we have been saying all along. If our kids think that doing science is a way of helping people in poorer countries of the world with problems of environmental degradation that poverty causes, it would make science much more attractive for them to study, and it addresses some of the issues that Dr Anderson concerns himself with. We are strongly of the view you have expressed. When I raised my previous issue about the capacities that are being developed, I noted, Dr Anderson, that you wanted to add something and did not. Can I just put the context of that, because it relates to the whole issue of what the British Council does? Alec Gaines, who I quoted earlier, goes on to say: “Relatively few academic scientists and engineers in Britain appear to have sufficient flair or insight to perceive the challenges in applied science offered by phenomena in developing and transitional countries. If that is the case, does the British Council not have one hell of a job to try and direct people and help them develop the capacities that are most needed by developing countries?”

**Dr Anderson:** First, if you are a Dorothy Hodgkin and you have got your PhD and arrive back in Malawi, what do you do next? The whole idea of the Higher Education Links Scheme is that you are building that capacity in the country, so you are developing with the University of Malawi or whatever it might be, so that there is somewhere for these people to go. In a sense the Higher Education Links Scheme ought to be complementary to a scheme like the Dorothy Hodgkin scheme. It gives the person somewhere to come back to. The whole idea of the Higher Education Links Scheme is to contribute to economic, social and human

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development in developing countries. That brings me on to another issue, which is about the intellectual capital of a country. DFID focused very much on the issues of health and education and poverty alleviation. The other aspect of development is around development of the intellectual capital. They have been funding that through these schemes, but what we are seeing now is the linear models of systems of innovation, which is what you are talking about, just are not right. The systems of innovation are very much more complex. The British Council has an important role to play in that, because of its networks of scientists and people in educational institutions, to be able to bring that rather complex system of innovation together and begin to see it and be able to deliver something in developing countries. There is a big agenda and it is one that needs tackling.

**Q237 Mr McWalter:** Given that big agenda then, why is it the case that the proportion of higher education links in S&T subjects has declined?

**Dr Anderson:** It is demand-led so it is up to the institutions that form the link what the subject area will be. DFID will take a view on that, as will the national government and the two institutions.

**Q238 Mr McWalter:** So universities are the key link in this, and our universities lack the capacity for whatever reason to deliver capacity-building on anything like the appropriate scale. Why is that?

**Dr Anderson:** A lot of the effort that went into the higher education scheme on the UK part was through the staff time that was contributed. Because of things like the research assessment exercise and so on, there has been a tendency within the UK for the scientists to want to focus on getting through the next research assessment exercise; and therefore they have been less prepared to put time into working with colleagues overseas and helping other institutions develop.

**Q239 Mr McWalter:** I do not know what proportion of your 8 million comes from DFID—perhaps 80%—and they are not interested in science, or certainly have not been lately—and so you have also veered away from having a great interest in these matters.

**Dr Anderson:** No, we do not get any money from DFID in grant-in-aid. DFID stopped giving grant-in-aid to the Council, all the money comes through the Foreign Office. Of the total spend of the British Council, about 160 million comes in terms of grant-in-aid, of which some 8 million is spent in science. The reason why the science money went down in the Council—and it was about 8 million in 1997—was because of the Rifkind cut, and it took until 2002 for us to be able to restore our budgets. In fact, the science spend of the Council is now going up, and we are hoping to see it rise to 9 million.

**Q240 Mr McWalter:** You would like our support to get it back?

**Dr Anderson:** Yes, please.

**Professor Sir David King:** The work of the British Council is terribly important, so I do not want my comment to be misunderstood, but we are talking about £6–9 million. The total budget for DFID for overseas aid development is this year £3.8 billion, rising to £4.6 billion next year. What is critically important is an understanding of the optimisation of the spending of that budget for the sustainable development of these countries. That is the critical parameter. We are now discussing a part of that exercise, but it should be, given the sum I have just mentioned, only a very tiny part. So the real question in my mind is whether the full role of science and engineering, technology, social sciences and economic sciences and the broad knowledge base, in developing countries understood within DFID sufficiently that we do get optimisation of that?

**Q241 Mr McWalter:** Why did you ask that as a question rather than making a statement, because you know it is the case that there is a radically insufficient scientific culture within DFID, do you not?

**Professor Sir David King:** I am suggesting that that is the case.

**Q242 Dr Turner:** Professor King, you expressed some quite strong views at the Johannesburg Summit. You felt that capacity-building and science and technology in international development were extremely important. Is this your view, or were you reflecting the Government's views?

**Professor Sir David King:** It certainly is a strongly-held view of the Government, yes.

**Q243 Dr Turner:** What input do you have in developing the UK Government's overall approach to world sustainable development and the negotiating positions it adopted on water and sanitation and renewable energy, which I know is a favourite topic of yours?

**Professor Sir David King:** In order to carry through what I am saying about the importance of the science, engineering, medicine, technology, social sciences and economics agenda—and I insist on saying all of those because I want to talk more broadly—it is very important that we have the proper advice base within DFID. My position is that DFID should have, as many other Government departments now do have, its own chief scientific advisor responsible to the Secretary of State directly for science policy within DFID. The reason I say that is, first, that it is critically important that a person who is fully embedded in science and understands it as a professional scientist is there to give advice to each Government department. My view on that is well known. Being responsible to the Secretary of State means that their advice is not filtered in any way, and it is directly given advice. Having somebody in such a position requires an understanding of what science can deliver in the international arena—and the

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mere fact of making that appointment. In recent months, I have had discussions with Mark Lowcock, the Director General for the Department of International Development in DFID, with Suma Chakrabarti, Permanent Secretary, and also now Hilary Benn. I have now been asked to join a small group to advise DFID on how to take forward this notion of fully taking into account a professional understanding of what science can deliver.

**Q244 Chairman:** In our first session with the department we had a little *entente* about social scientists against, shall I say, a real scientist. You will understand the background, Professor King. So you would not want a social scientist in that position, would you?

**Professor Sir David King:** What we know is that within DFID there are a large number of social scientists, and especially economists currently. I do believe that social science and economics is critically important to the functioning of that department, and good advice in that area. You are quite right. What we need to balance this number of people in those sciences is a very senior person at the highest level, who would be drawn from what we would describe as the hard sciences.

**Q245 Chairman:** Would the advert make that very clear, or will there not be an advert?

**Professor Sir David King:** I am sure that if the post was agreed, there would be an advert, and I imagine that I would be heavily involved with the appointment.

**Q246 Dr Turner:** It is not particularly clear at the moment that there is anybody in the Government who takes an overall strategic view of science and technology in the international development context. Do you think this is a role that the putative person that we are discussing in DFID should be charged with undertaking, because an awful lot of different Government departments, research councils and so on, dip a toe in the water of science and technology in relation to international development, but it all seems to be unco-ordinated.

**Professor Sir David King:** Yes, it is. I think we are making progress on this. I chair a committee, which is appropriately called, the Chief Scientific Advisors' International Committee.

**Q247 Chairman:** DFID is not a member of that, is it?

**Professor Sir David King:** DFID has not been a member. We have invited Mark Lowcock to join the committee and he has agreed to do so as a permanent member. Over the last six months, DFID has sent a representative at our request and over the last six months we have focused our intention on the issue of capacity-building, and I think we are making quite substantial progress. There is a long way to go. For example, I do think somebody of this seniority with this responsibility is required. The budget for research and development in science, engineering and technology in DFID is £149 million a year. That, in itself,

would demand a person of the stature we are now discussing to see that the money is well spent. But in addition, bringing an understanding of what is required for sustainable development through the development of science, engineering and technology, is an even more important point of delivery for such a person; in other words, providing policy advice to ministers for them to make an appropriate decision, from a clear understanding of what can be delivered.

**Q248 Chairman:** If you had not taken this initiative would it have happened, do you think? Quite clearly, you have driven things to happen, and you have been saying that for the last five or 10 minutes, and that is very welcome of course; but if it had not been raised do you think anybody else would have done it?

**Professor Sir David King:** Chairman, I think that is my role in government, and if I had not done it I think it would have been a dereliction of duty for the Chief Scientific Advisor not to have done it.

**Q249 Chairman:** But it did not happen before you got the post.

**Professor Sir David King:** It seems unfortunate.

**Chairman:** I think you have answered that question, Sir David.

**Q250 Dr Turner:** It seems quite worrying that DFID should say that they do not think they have got any responsibility to maintain a UK research capability. Somebody, surely, has got to take responsibility for ensuring that there is a core competence in international development science maintained in the UK? Is it your view that that should be centred within DFID?

**Professor Sir David King:** Absolutely.

**Q251 Dr Turner:** Or should another department take it on?

**Professor Sir David King:** No, I think it should be centred in DFID. The work of the Office of Science and Technology should be to co-ordinate the work that is done in DFID in S&T with the work done in the other departments we have mentioned. Given that DFID would take this role on board fully, we would then be pulling together the DTI's function, the FCO, the Royal Society, the British Council and the research councils. They all sit on my international committee. We can co-ordinate that activity, but the lead department surely has to be DFID?

**Q252 Dr Turner:** I think you are saying the sort of things we would expect. You are seeking an end to the current state of total lack of co-ordination, it seems, where the EPSRC will say, "we are not interested in following that. We do not want to fund that; try the ESRC". Things will then fall between the cracks. DFID has also separated its aid from its research funding. Do you think that this is right? Do you not think that they should be inter-dependent?

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**Professor Sir David King:** They should be fully integrated.

**Q253 Chairman:** It has been a disaster, has it not? Why do you not say it, before Jeremy Paxman asks you?

**Professor Sir David King:** Chairman, there is a very important issue here, which is that when faced with difficult problems in developing countries, problems of such extreme poverty that today's hunger is the issue, then one has to understand the response, which is to provide the food—provide the fish instead of teaching how to catch it. It is an immediate response to alleviate an immediate problem. That is what we have to weigh it against: the sustainable development, which I sense this Committee would like to see, and so would I, against the kind of aid programme which, if it was terminated, would leave nothing in its place. It is very, very difficult to say “no” to the demands from a starving country.

**Q254 Dr Turner:** That certainly is so, but nonetheless somebody still has to have the responsibility for making sure that sustainable development occurs in that country, or at least is facilitated in that country. If it is not in DFID, there does not seem to be anyone else in place to pick up the can, so it virtually has to be DFID, otherwise it does not make sense for us to talk about S&T capacity for the world, neither can we collaborate with wider European Union efforts or World Bank efforts, or anybody, if we do not have a centrally established function and a recognition of our role. Do you agree?

**Professor Sir David King:** It is very important for all of us here today to explain the importance of what we are now discussing. When I travel to India and visit the Indian institutes of technology, I find absolutely first-rate institutes there, with first-rate scientists. That is why the Americans were trying so hard to attract them over. Their system is now generating a wealth base for that country which is growing rapidly. I visited the Swaminathan Institute in Chennai about six weeks ago. That is quite a remarkable institute. Swaminathan is a plant scientist who uses every kind of modern plant science, including GM, to generate crops that are sustainable and more production in different localities in India. He is one of the people who has engineered the Indian green revolution. He is an older man but he is a top scientist, with world-wide recognition. He stayed in India and did not move to the United States. These are examples that we need to demonstrate in terms of the enormous added value of placing those Indian institutes of technology in India, in the period immediately after independence—there are four institutes, each put in by one of the Western powers—and the enormous return to their economy today from that initial capacity. We need to look at that very carefully.

**Q255 Dr Turner:** I am sure you have been making your views and critical comments to DFID to try and tempt them to remedy their ways, but what has been their response?

**Professor Sir David King:** Very positive. The Secretary of State will shortly give a talk to the Foundation of Science and Technology on capacity-building in science and technology. I will be talking on the same platform, and that in itself is a good sign.

**Q256 Chairman:** You have identified some problems with DFID. Is it now a prime candidate for the subject of a science review within DFID, or is that what you really think you are doing?

**Professor Sir David King:** You are asking me the question about which are the prime subjects. We can only go into one department at a time. We do not have the resources to cover too many. We are still wrapping up our first review of DCMS. There are a good range of departments that we ought to be targeting.

**Q257 Chairman:** You start with soft ones, and get geared up—is that it?

**Professor Sir David King:** We thought DCMS would be a soft one, Chairman!

*The Committee suspended from 5.28 pm to 5.53 pm for divisions in the House.*

**Q258 Mr McWalter:** I want to put a postscript to the remarks by the Chief Scientific Officer about DFID. It was a sterling defence, I thought: if you are looking at short-term projects, it is difficult to look at intermediate-term projects. In fact, if you are taking seriously somebody with a filthy or inadequate water supply, you need to get some water to them as a short-term measure, and you need to drill for water in their locality; and it does help to have a geologist or two around. In a sense, while you can portray it as that, you sometimes have to deal with short-term crises without scientific expertise. I would submit, Chair, that it is important that even when you have short-term crises, you have scientific expertise as available as possible. When we raised this with the Chief Executive of the Natural Environment Research Council, he was very strongly of the view that that was indeed what you should do, not least because you could actually destroy a water supply by inappropriate drilling. I hope that somehow or other we can get the message through that even for short-term gain, it is important that you have recourse and access to appropriate scientific expertise. I am hoping that the Chief Scientific Officer would agree that he would perhaps change his plea for short-term as against medium-term strategies as a result.

**Professor Sir David King:** You are absolutely right. It does not quite change what I said in terms of delivering food aid, which can be delivered by air, being parachute-delivered, which is a rather different situation from the one you were describing. For example, satellite observation in



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terms of water supply is one of the critical capabilities we now provide, so I would agree absolutely with your comment.

**Q259 Mr McWalter:** Whilst we understand the clear importance of capacity-building, I would like to ask Fiona a question. You have mentioned the Foreign and Commonwealth Office's role in scientific and technological capacity-building is limited by lack of resources. Why is that the case? Why is there not a higher priority for these matters?

**Ms Clouder Richards:** If we first look at what the Foreign Office has done in terms of science and technology over the last two years, we have over doubled our capacity of S&T officers in the field.

**Q260 Mr McWalter:** Can we make a distinction there? I am aware of a very significant expansion in first world countries, where of course we have the added incentive of exports, credit export markets and exchange and research expertise and so on, but I hope you will make a distinction between that form of investment and the capacity in developing countries where I suspect, if anything, the funding has gone down.

**Ms Clouder Richards:** In terms of thinking about what we are expecting these S&T *attachés* in our embassies to do, the Foreign Office, in consultation with other Government departments was successful in obtaining funding out of the spending reviews 2000 and 2002 to build up this science and technology network. The decisions about where those officers were best placed were again made in consultation across Whitehall. The criteria we were looking at were the quality of the science base of the country, the opportunity for the UK to forge a partnership with that country; to look at the potential to use science to facilitate trade and inward investment, and also to look at that country in terms of its future global influence, and a window of opportunity to engage with that country on science and technology. The decisions to place those officers was very much taking account of Government strategy, which was at the time of the *Excellence of Opportunity* White Paper. We were not looking at, in terms of the subject of this inquiry, at capacity-building in developing countries. There are resource pressures on all of us, so to be realistic it is extremely unlikely that the FCO would suddenly deploy a large number of extra S&T officers in developing countries.

**Q261 Chairman:** You cut some, for example, in Washington DC.

**Ms Clouder Richards:** We have not cut; we have restructured as part of the wider restructuring in that embassy. That again is to do with wider FCO resource pressures. In terms of the number of people delivering on S&T from Washington, that number remains broadly the same.

**Q262 Chairman:** "Broadly the same" is a euphemism for "not the same", is it not?

**Ms Clouder Richards:** In terms of the people, in terms of whether they are UK-based or locally-based, yes, there is a difference. However, we should be looking at the outputs from that S&T team. We are therefore in discussion with Sir David and other stakeholders about priorities and not just in Washington, but for all our S&T officers.

**Q263 Chairman:** It is not based on social science against hard science, is it, in terms of the areas you want to employ people, because of the excellence you want to develop?

**Ms Clouder Richards:** No. In terms of the priorities of the S&T officers, in terms of what they should be delivering, that is very much looking first of all at UK over-arching Government priorities. So looking at recent issues in Government statements about science and innovation, at the policy level. It is about looking at the technology priorities that come out of the DTI's innovation review, and the sector priorities from UK trade and investment. Then it is looking at the research priorities that interface with research councils and other partners in the science base. That is determining what S&T officers around the world are doing.

**Q264 Chairman:** Is this going to be part of the science strategy that we are going to be informed about at some point?

**Ms Clouder Richards:** Yes. We have an exercise that is ongoing where we have consulted with working contacts in Whitehall. We now have an ongoing consultation within FCO, and we will be informing the Committee as that strategy develops.

**Q265 Chairman:** If you are making all these grave decisions, how about having a chief scientific advisor in the Foreign Office—you, he, she?

**Ms Clouder Richards:** I would not claim to be the same status as other chief scientific advisors in other departments. There is an issue again of resources and of the nature of the Foreign and Commonwealth Office. We are not a department which commissions large amounts of research, and so again in discussion with OST it has been agreed at this time that we would not have a chief scientific advisor. There would also have to be the difficult decision, if we did, that it takes resource away from the number of S&T officers you can have in our embassies around the world.

**Q266 Chairman:** What could be more important, David King, than having a replica of you, a clone of you, in a department which has such a strong influence on our influence as a nation across the developing world? You cannot do everything yourself.

**Professor Sir David King:** You are flattering me with your question, Chairman. I think that I will respond by saying that you will have heard through Fiona Clouder Richards's mouth that we have a very good science representative in the Foreign Office. You make a very good point. We are doing rather well; we have doubled the number of science and technology cultural *attachés* and this is having

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quite a big effect around the world. Science has a much greater visibility in the Foreign Office than it previously had; but there is still a long way to go.

**Q267 Mr McWalter:** Does all of that need to be brought together by somebody whose brief it is to ensure that scientific capacity-building is an explicit objective of the office and the department?

**Ms Clouder Richards:** My role in the FCO is to manage this global network of S&T *attachés*, but also to ensure that science issues are appropriately addressed within the Foreign Office. That is very much done in consultation with Sir David and the Chief Scientific Advisors in other Government departments. This inquiry has been a useful stimulant to raise awareness within the Foreign Office, and to encourage dialogue with other departments about the importance of science and technology for capacity-building. Indeed, in preparing for this inquiry, we have been able to engage more broadly within the Foreign Office to start exploring some of these issues and what we might do. The Foreign Office has a number of existing mechanisms, which would help with this capacity-building in general, so we would want to look to an over-arching UK strategy in this area and then ensure that through our mechanisms we are well aligned to deliver on the science and technology capacity-building agenda. Some of the methods we have in place, for example the funding stream called the Global Opportunities Fund, has the potential to assist with projects in this area. We have a number of ways in which we engage with DFID, both through funding mechanisms but also through policy issues. For the Foreign Office, something that has not yet been touched on during this session, is the whole issue of engagement with big multilateral organisations with the various UN commissions—the World Bank, the OECD—and this is where we would like to be much more co-ordinated, and where a more strategic approach is likely to help; and where we can play a role in ensuring maximum effect for the UK position in those international negotiations.

**Q268 Chairman:** You are making a very, very strong case for a multi-faceted approach in the Foreign Office that you have for science and technology. In a document which was partly from the Treasury, it stated that in investing in innovation the departments which commission an appreciable amount of science research would need to employ a chief scientific advisor. Are you telling me that the Foreign Office is immune from that approach?

**Ms Clouder Richards:** No, not at all. The Foreign Office, though, as has been agreed with OST, does not commission large amounts of research. We are very much using the research from other Government departments and assisting them in an international context.

**Q269 Chairman:** Advising them about international treaties and so on?

**Ms Clouder Richards:** Yes, and that would be done through the relevant experts in the Foreign Office that are leading on those international negotiations. They would involve me, and I would consult with Sir David on this issue. An example would be negotiations in the United Nations on cloning.

**Q270 Chairman:** I am sure Defra could say that too, could it not? I am sorry to persist in this. It does seem to be a real opportunity to look at all the partners equally. Defra could say the same thing, could it not?

**Ms Clouder Richards:** But Defra would commission very large amounts of research in direct support for their policy objectives.

**Q271 Mr McWalter:** I was going to ask that Chair, because it seems to me that there could be a distinction between the kind of research which would perhaps have a very immediate consequence, which would be of a more strategic nature involving getting, say, a number of African countries together to see whether some of the more finished agricultural products they produce might meet the demands, say, of the American FSA; so there could be issues that are longer term which require expertise, and that we could be really helpful about but which would not be in the immediate remit of DFID in the normal way. It might be—and we have heard already from the British Council of some of the work done in British universities—that as it stands it does not address that sort of issue—it does not meet the research assessment exercise criteria and it is not rock-breaking, but it is also vital for development of capacity. It seems to me that if you had a chief scientific officer, they could be arguing this sort of case, possibly arguing it with people who themselves—and I do not know what proportion of people in the Foreign Office have got science degrees—but I tend to think it is not that many—arguing it with people who may not be in that position and have not thought about these things very much, with a view to trying to make some of those things happen. I hope that perhaps coming out of these discussions you and Professor would go back to say, “actually, on reflection, we maybe do need somebody doing this sort of job”.

**Dr Anderson:** In the British Council we have science programmes in 60 countries world-wide. We have tried to create a core and core plus model. The core countries are those that are common to the Foreign Office and OST and the British Council and so on, but they tend to be the countries with a higher percentage of GDP being spent on science. The idea of the core plus is to address those other countries. You will see a lot of the transitional and developing countries sitting out in that core plus.

**Q272 Dr Turner:** We have been pretty nasty to DFID so far this afternoon, so it is only fair that we should spread it around a bit! It has been put to us the belief that there are open-ended opportunities for the participation of British

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commerce and industry in poverty reduction and international development; but there is a disappointment that the idea that we should be collaborating in the excitement of designing, commissioning and operating sustainable factories that create no pollution and little waste of any sort has evidently failed to get through to the DTI. Can I ask Dr Tibber whether he feels there are any areas where the UK has a strength or comparative advantage in science, technology and engineering capacity-building in developing countries.

**Dr Tibber:** Perhaps I could start by explaining that the organisation I represent is not the DTI; I am from UK Trade Investment, an organisation that is jointly parented, resourced by the Department of Trade and the Foreign Office, but acts independently. Our remit is supporting business. We are very much a business-driven organisation and we have been set up to respond to the opportunities overseas that UK industry sees for developing overseas business, whether it is exporting or investment, and where it wants help from the Government. That tends to be our focus, rather than the capacity-building issues you have been discussing this afternoon. That does not mean to say that there may not be some areas of overlap between the purely commercial interest that is our main driver and some of the capacity-building issues in such sectors as agriculture or health, for example. The driver is business.

**Q273 Dr Turner:** This is indeed separate from the principal issues that we have been discussing, but it is not irrelevant. The DTI certainly should have an obvious role in encouraging UK companies to get involved in operations in developing countries. Is it your view that the DTI has been as proactive as it might be in this context, and can you give any examples of successes?

**Dr Tibber:** I come back to the point that I am talking about UK Trade Investment and not the DTI. We are not proactive in specifically pointing industry in the direction of capacity-building. We do point industry in the direction of business opportunities which may overlap. For example, the issue that comes to mind is the small case for example where we have a team, the business development team, which helps British companies to access business coming out of multilaterally-funded projects. There, there is some example of overlap between business opportunity and capacity-building. I am thinking of an example in Algeria where a company has won some business that is multilaterally funded, which will be of benefit to them but which will also help build the Algerian capacity to deal with the consequences of flooding in particular, and that type of opportunity does come up.

**Q274 Dr Turner:** Do you get any assistance from DFID in this work?

**Dr Tibber:** We talk to DFID in sectors that look as though they might be of interest. We have not done very much of that in the past. The dialogue has not been very productive. We have just

launched another round. I think it is fair to say that DFID are more open to looking to areas where there might be overlap. We have some sessions planned where we will look at particular sectors where there may be areas in which we could work with DFID.

**Q275 Dr Turner:** Are you aware of why DFID is not represented on the cross-departmental International Science and Technology Trade Investment Committee? Do you ever talk to DFID about their absence from that?

**Dr Tibber:** We do talk to them. They are, as you have heard, represented on the Chief Scientists' Committee. They are represented on a Government Whitehall-wide co-ordination group, in which we talk to all Government departments with some interest in trade and investment issues overseas. There are structures which enable us to talk to DFID at that sort of level. We also talk to them on quite specific sectoral areas.

**Professor Sir David King:** We are currently discussing bringing together ISTTIC and the Chief Scientific Advisers' International Committee, CSAIC, in which case DFID, since it has now become a full member of CSAIC, will be a member, if that is the way we go.

**Q276 Dr Turner:** Will you wish to see DFID playing a full part in supporting a strategy of international innovation with special emphasis on particular countries?

**Dr Tibber:** We shall certainly be engaging with DFID. As I say, we have just launched a new process, and will have to wait and see how that comes out.

**Q277 Dr Turner:** Or at least if you reform DFID.

**Dr Tibber:** Quite.

**Q278 Geraldine Smith:** The evidence we have previously heard suggests that DFID is really bad at engaging with other Government departments and agencies. What is your own experience of this? Are there particular collaborations that could have taken place that would have been beneficial that just have not occurred?

**Professor Sir David King:** You are inviting us to be critical of DFID's actions in the past, and in a sense I feel we have been there this afternoon already. I would rather focus on the direction in which things are currently moving because that is quite optimistic.

**Q279 Geraldine Smith:** Can I ask you, without being too critical of them, to at least explain why you think that there have been failures to collaborate work with other agencies and departments in science and technology. Look into the future; what is going to change?

**Professor Sir David King:** I can only give a personal view, and that is that I think it was understood by the Secretary of State that it was very important, in order to have any effective aid programme, to cut DFID off from other considerations such as the

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one we have just been discussing, the UK trade and investment policy, because it might mean that it is distorting the aid policy. That would be the positive way to look at it.

**Q280 Chairman:** I still do not understand, Professor King, what is in it for the UK, all this interaction and collaboration. Is there not still a hint of colonialism, a whiff in the air, of colonialism? Others have told us that. Is it just about getting research done? What is it really all about? Why do we bother with it? Stimulate me and tell me why we should double the budget in this area.

**Professor Sir David King:** If we look around the world, we see a number of global problems of poverty. Why do they impact on the United Kingdom? It is because problems of the countries that have poverty impinge on our own interactions around the world. We do have currently a major problem with terrorism, and I do think this is one way in which international problems are re-visiting us. If we look at the second issue I would raise, it would be global issues that can only be tackled on a global basis. For example—you will not be surprised at me mentioning this—climate change: we are not going to be able to tackle climate change except by getting global action. India and China are the two most rapidly growing economies. The Indian output of carbon dioxide per person at the moment is about 1.5 tonnes *per annum* compared with our 8 tonnes, and that will rise. India has large coal reserves, and the output will grow as their economy grows. I would like to see capacity-building allowing them to leapfrog beyond use of fossil fuel technologies into the technologies that we will all need to develop to avoid carbon dioxide emission. Those are two major problems we are faced with currently where we need to take a global view. We cannot withdraw into this island and simply deal with things separately. I do not think we can really tackle the issue without also taking on board our global responsibilities for countries where poverty is rife.

**Q281 Chairman:** What will be in the top line of this appointment for this chief scientific advisor in DFID? What will the job spec say? It will be develop what? You may not have written it yet but I bet you have thought about it!

**Professor Sir David King:** I have not, but can I have a shot at it? I would say that to develop a coherent policy for international development based on an understanding of what science, engineering and technology could bring to that policy; and to develop a research policy to back it up.

**Q282 Chairman:** Do you think you will meet resistance in any quarters in Whitehall?

**Professor Sir David King:** Yes.

**Q283 Chairman:** You have got them identified! Would you care to hazard a guess who they might be? How many departments of individuals might be resistant to this kind of approach?

**Professor Sir David King:** I do not know, Chairman.

**Mr McWalter:** I think, Chair, it is anybody who wanted the money that was being spent on such an enterprise rather something else.

**Q284 Chairman:** Are the Treasury on board?

**Professor Sir David King:** The Treasury are very strongly on board. Number 10 and Number 11 are both very strongly on board on the issue we have been discussing today. Both the Prime Minister and the Chancellor of the Exchequer understand in a very real sense what science and technology can bring to society. I have just been completing an updated review of the current state of science amongst nations. We chose to review the science output of 26 countries. We limited ourselves to 26 out of the total of 190 countries in the world. That group of 26 is the most productive group in terms of size output, and they produce 97.5% of the total world citations to science literature. That just underlines to me the important point that actually there is a limited number of countries that have real access to what science and technology can deliver; and yet I think all of us around this table understand that what was delivered in terms of our own economies and all of those economies that benefited from the industrial revolution, came through science, engineering, medicine and technology developments.

**Q285 Chairman:** Finally, in relation to the DFID strategy which is going to come through shortly, have you fed this kind of idea into it? Have you been consulted in the development of the strategy?

**Professor Sir David King:** That is also a very good question. The Chief Secretary to the Treasury has sent a letter out to all departments saying that their science and innovation strategies and their reviews should be reviewed if possible by the Chief Scientific Advisor, and this process is—

**Q286 Chairman:** “If possible”.

**Professor Sir David King:** Should, wherever possible.

**Q287 Chairman:** That is a funny phrase.

**Professor Sir David King:** It is a funny phrase, but it means that it is not a command; but in practice it has meant that all departments are submitting their science and innovation strategies to us. In the case of DFID we are currently looking at the third draft of their science and innovation strategy. By that I mean to imply directly that they are responsive to what we are commenting on within their strategy.

**Q288 Chairman:** What would the key in this strategy be as far as you are concerned, as Chief Scientific Advisor, if possible? What would you put into it?

**Professor Sir David King:** If I can just put one clause down, it would be to take science out of the box. Science impacts on all aspects of our modern societies, and I include developing countries as modern societies. We need to take this very broad

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approach to the potential impact that science can have on policies in any aspect of government, but in particular in regard to this discussion on international development, and in terms of poverty eradication it is absolutely key.

**Chairman:** Thank you very much for feeding that into the committee. We are getting close to seeing the Minister himself and his team so we have a lot of information today which will help us cross-question.

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**Wednesday 26 May 2004**

Members present:

Dr Ian Gibson, in the Chair

Dr Evan Harris  
Dr Brian Iddon  
Mr Robert Key

Mr Tony McWalter  
Geraldine Smith  
Bob Spink

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*Witnesses:* **Mr Mark Lowcock**, Director General, Corporate Performance and Knowledge Sharing, **Ms Sharon White**, Director, Policy Division, and **Mr Paul Spray**, Head, Central Research Department, Department for International Development, examined.

**Q289 Chairman:** Good morning and thank you very much for coming again to talk to us in this inquiry. As you know, we are heading out for Malawi soon, so we have been talking to the ODI about it and other groups too. So we hope we are very well tuned up on what to look for when we go out there, but thank you for coming along. Let me start off by saying I have this impression that DFID has suddenly got very active on these kinds of issues. Is that just fantasy on my part or have there been a few events happening that I have missed, Mark?

**Mr Lowcock:** I think over the last two years we have increased our activity in this area and it is certainly the case that a range of things, including the Committee's inquiry frankly, have encouraged us to look harder than we did say four or five years ago at this set of issues.

**Q290 Chairman:** Just briefly then, what are the major areas of activity that you have now engaged with that previously you dabbled in, shall we say?

**Mr Lowcock:** As you know, we have just published a new draft strategy on the research framework, which sets out plans to increase by 25% between last year and the year after next our funding from the central programmes for research, including science and technology. About 80% of that is science and technology related. Also, through our country programmes we have a growing level of activity on these issues. We are also, though, trying to strengthen the links we have with other bodies in the UK and internationally in developing countries who are interested in this set of issues and a big thrust for us of the research strategy is building those wider linkages.

**Q291 Chairman:** Has a new minister made any difference whatsoever? You might not want to comment but be brave, please.

**Mr Lowcock:** When the Government was elected in 1997 it published a White Paper setting out a very strong store on wanting to deliver early progress on the Millennium development goals and that was partly against the context that aid levels to the poorest countries during the 1990s had fallen very dramatically. Our own bilateral programme fell by about 25% and there was, frankly, a crisis in lots of developing countries, especially those in Africa, and the Government wanted to be able to demonstrate early on that it could make investments in health and education and improving economic management

which would have an early significant impact on people's lives. In 2000 it published another White Paper which, unlike the first White Paper, committed it to increasing funding in some areas of research. In 2002, as you know, we did a piece of work on research for poverty reduction and that led to the work we have been doing, which has taken us now to the draft strategy and which the Government has committed to a much faster rate of funding growth for research. So I think there has been an evolution of the Government's overall thinking and what it wanted to prioritise and when and how best to contribute to the Millennium development goals.

**Q292 Chairman:** When will that evolution develop a new creature then? Evolution always produces something at the end of the day. When will this big climatic moment happen in terms of your general thinking?

**Mr Lowcock:** I think that it is a reflection of the announcement the Government has made to increase funding for research that it wants to do more in this area. The Government also wants to continue to invest substantially in things which have an early and immediate impact, but it wants to, as I say, put more emphasis than certainly it did in the late 1990s on things which might not have an immediate benefit but could have a massive longer term benefit for developing countries.

**Chairman:** Yes, okay.

**Q293 Bob Spink:** You will not be surprised to learn that people in this Committee feel that science and technology have a major role to play in tackling poverty, curing the world's problems, whether it is health, agriculture, feeding people, wealth creation or whatever. We think that science will deliver the solutions in a sustainable way. I just wondered what your view was on the role of science and technology in these matters.

**Mr Lowcock:** We agree that science and technology can make a substantial contribution to achieving the Millennium development goals. The reason why ministers want to finance more in this area is exactly because they have that belief. Equally, they also believe that better uptake of today's existing science and technology could also make a dramatic contribution to the Millennium development goals. If I could give a couple of examples. Two-thirds of the early deaths that occur in developing countries are preventable through technologies, drugs and

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treatments which are available today. Part of the problem is getting access for poor people to those technologies. In the agricultural area the international system has, for example, financed the development of more than 200 new species of maize over the last 20 or 30 years, partly financed by us through the CG system, yet less than half of the maize cultivated area in Africa is planted with those new seeds. So it is a matter both of investing in new science and technology and of generating better uptake of today's science.

**Q294 Bob Spink:** Then why has DFID moved to a policy of weakening its links with projects and programmes that force through this close link with science and technology, existing and new, and gone to just direct budgetary support of governments? Do you think that is in some way moving away from you achieving your Millennium goals?

**Mr Lowcock:** Well, we are investing more actually directly in science and technology. The reason why the Government believes that budget support is a good way to support countries committed to reducing poverty is that many of the problems in developing countries are across-government wide. They are about an inability through lack of resources or other problems to deliver the whole range of public services, including for example support for national science and technology or research organisations, and the Government believes that for countries like Malawi, which is able to raise maybe 10 or £20 per head a year in taxation from its own sources, it is not possible to have decent public services for all its people from those resources. The Government believes that by supplementing those resources through the Malawian government budget it will help achieve the Millennium development goals by helping to finance better public services and the other institutions that any state wants to have, including in the science and technology and higher education sector.

**Q295 Bob Spink:** Okay, but what control do you have over the way the money is spent once you have given it to a country's general budget? If we felt that it was right to, say, have an attack on Malaria and eradicate Malaria in an area in Africa—we have got the technology and science to do that, if we wish, if we can spend the money on it—would it not be better to actually focus on that and see that project through rather than simply giving the money and hoping that that particular government will use it effectively?

**Mr Lowcock:** Before we give budgetary assistance to a country we satisfy ourselves that the set of priorities they have is consistent with progress towards the Millennium development goals. The scale of need in any country is such that it will face a set of choices. In the past donors used to have a much stronger approach about basically imposing their own choices and the Government believes that a more sustainable approach to supporting a country's development is that once we have confidence that a country is basically on the same agenda that we are on, to respect their priorities and

recognise also that they are getting assistance from a whole range of donors. If everyone comes with their own agenda that becomes very difficult for the country to manage. I was in Zambia last month and the finance minister was complaining to me there that there are 29 donors operating on HIV/AIDS. I have had other finance ministers in African countries say to me that they spend 60% of their time managing the donors. The Government is committed to trying to make it easier for developing countries to manage the whole of the external systems and to respect their priorities.

**Q296 Bob Spink:** I think you have answered the questions extremely well. You have dealt with the issues very well and thank you for that. How do you help developing countries to identify their particular science and technology issues and needs?

**Mr Lowcock:** Maybe I can ask Paul to give a couple of examples of the things that we are involved with, but as you know, we have a network of country offices which include typically in them someone with an engineering background, someone with a medical background, someone with a natural sciences background and the main job of those people is to discuss with the government and the other institutions in the country what priorities they have for British assistance and it is through that process really that, for example in Ghana at the moment, we are involved with supporting the country using information communication technology for its teacher training programme. That has emerged through a discussion between the Ghanaian government and us locally. But maybe Paul could give one or two other examples.

**Q297 Chairman:** Just give us one example, Paul.

**Mr Spray:** Well, water shed development in India, for example. The Indian government is keen at looking at environment and development collaborations, in particular watersheds, particular valleys that have formed one watershed. The UK supports that programme in about four states of India and it is quite large amounts, 3 or £4 million a year, something like that. In addition to supporting it, what we have done is to encourage research during the implementation on things like what are the limits to water resources in these watersheds, how can decision making best be organised on the allocation of water, and we paid for three water resource audits in particular states of India to cover watershed management. We are planning a conference—and when I say “we”, this is actually the country office, DFID in India—on research findings within watersheds which include research that we have funded from the central research department. They want to have a conference and the long-term aim that they are discussing with the ministries in the central governments in India who deal with this is to try to encourage a review of the impact of these watershed management programmes. There has already been one workshop and they are moving forward on that. That is the kind of interaction.

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**Bob Spink:** But this is project support, it is not general government budgetary support, so we come back full circle. Thank you, Chairman.

**Q298 Geraldine Smith:** Your research strategy states that approximately two-thirds of your centrally funded research will be directed towards four major research themes. Why have you picked those particular themes?

**Mr Lowcock:** Well, the four themes, improving agricultural productivity, especially in Africa, killer diseases and climate change and states that work in the interests of the poor, are ones that we have judged are central to progress in a lot of countries on the Millennium development goals. There is a set of other activities that we also think will contribute to that but we wanted to have a strong focus around those four areas.

**Q299 Geraldine Smith:** What other themes did you consider and reject?

**Mr Lowcock:** We have listed in paragraph 35 of the strategy a set of other areas that we are also looking at. We also expect to continue some of the research we have been financing in areas like, for example, engineering and water. We do a little bit on transport, we do a little bit on energy. We expect to continue in those areas also, but we wanted to have a stronger focus on the four areas that I have outlined because we think that we can make a significant impact through research in those areas to achieving the Millennium development goals.

**Q300 Geraldine Smith:** Research areas such as information and communication technologies in rural and urban planning were identified as suitable research topics in the appropriate technologies workshops. Why do these not appear in the research strategy?

**Mr Lowcock:** We do fund research on those things at the moment. I guess what we are saying is that we can continue to fund research in those areas but we expect to spend two-thirds of the resources on the other areas.

**Q301 Chairman:** Do you want to add anything, Paul Spray?

**Mr Spray:** Absolutely. Some of the ones that you mention there are relatively cheap for research expenditure. Social science, that sort of planning studies, can be so we would anticipate continuing funding in those areas. There is an important evaluation happening or about to happen of the knowledge and research programme in the old engineering area which does cover, in fact, those two and we want to find out how things have gone before we take decisions on that.

**Chairman:** Sharon, if you want to leap in at any point, please do so if you want to add anything.

**Q302 Dr Iddon:** You have already said there is a lack of co-ordination and too many donors working in the field of HIV/AIDS in some countries. I would be a bit critical of these four areas because they look like the four areas of research and aid donation that

nearly every other country in the world would probably choose as well. Are you going to be able to co-ordinate your activities with the rest of the people in that case in these four areas?

**Mr Lowcock:** Well, co-ordination is a key issue. Just to take the example of agricultural productivity, there are 800 million people who are permanently or intermittently hungry and the top Millennium development goal is to reduce the proportion of people in that sort of extreme poverty. We know that there are lots of technologies which if taken up, particularly in Africa, or if developed further would make a substantial contribution to that. Likewise, with killer diseases there are 3,000 people a day die of Malaria, much of it preventable. Equally, we believe through research that we are financing with Wellcome and GlaxoSmithKline and others on bed nets and new combination drug therapies and completely new technologies we can make a substantial contribution to that. So we are not saying there are not other things that could also be financed beneficially. What we are saying is that there is a pot of money. The Chancellor is trying to double the level of aid resources globally at the moment in reflection of the fact that the overall resources are insufficient to meet the goals. In those circumstances, the challenge for us is to try and do the best we can in picking the priorities.

**Ms White:** Could I just add one point on that. In terms of whether this is a crowded field or not, if you look at both climate change and weak states, on the climate change area there has been a huge amount of work on the science but there has been very little work on actually the implications for poverty reduction and that is the particular gap that we want to fill. Similarly, on state failure the donors have been very focused on so-called better performing states like Uganda and Mozambique and the international community—and we are leading this in some ways—see this as a real priority to have much more research and analysis on poverty reduction in the countries where 600 million people are either living where the state is in conflict or you do not have a government which is committed to poverty reduction. So we are deliberately trying to target the gaps in investment.

**Q303 Dr Iddon:** We will come back to co-ordination in a minute, but before we do could I just refer to your research strategy, where it says that you are carrying out an horizon-scanning exercise. Is that a one-off or is it an ongoing exercise?

**Mr Lowcock:** That will be ongoing, I think. We want to try and do more work than we have done in the past to look in the much longer term at the set of challenges and issues that developing countries will face. This is not something we expect to do now and then stop doing. I expect it to be a continuing thing.

**Q304 Dr Iddon:** Have you talked to Defra at all about their horizon scanning exercise, which seems to be a model?

**Mr Lowcock:** Yes, we have had some discussions with them and with other government departments as well. Our top environmentalist has just joined the



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board of the Darwin Institute and as part of a review that we are doing on the way the department accesses advice on science and technology we are talking to a number of the chief scientific advisers. I spoke on the phone the other day to Howard Dalton and that is part of a broader process of strengthening our links with him and others.

**Q305 Dr Iddon:** Defra has allocated a sum of money for horizon-scanning but we cannot find a sum of money that you have allocated. We may have missed it. Is there a sum of money set aside for horizon-scanning?

**Mr Spray:** No, there is not. Defra has a budget of about £2 million on its horizon-scanning programme so the discussions that we are having are really about how we can feed the horizon-scanning in at a fairly high level in DFID on a regular basis, because these are issues which do not just concern research, they concern the big opportunities and threats that are coming up. So we do not as yet have a budget and we really need to scope it before we could put a number to it.

**Mr Lowcock:** I think that is a good point actually. I think it is something which we will perhaps reflect in the final version of the strategy.

**Q306 Dr Iddon:** Yes. I mean, £2 million on a £150 million budget suggests that on your budget, which is 80—£100 million or thereabouts, you are going to be needing £1.5 million and if you have not allocated it how do you do the horizon-scanning? Can we just return to co-ordination now. You are proposing to set up a UK funders' forum on international development. Can you just explain to the Committee why you need one and who you intend to invite on to that forum, please?

**Mr Lowcock:** This proposal came from a study done for us by RAND Europe in 2003 and I think it was suggested to them by a number of the research councils. The basic rationale is that there is a number of organisations in the UK, some public sector, some independent, some private sector, which are funding research in international development. In some areas of research, for example the medical area, there is quite a lot of co-ordination and sharing of information and there have been some good models of how funders' fora have identified duplication or gaps which then the interested parties can set about addressing and the idea that we floated here for a funders' forum on international development comes from the same analysis really.

**Q307 Chairman:** Do you have all the research councils on that, because as I understand it the SPRC is not doing anything in this field at all at the minute?

**Mr Lowcock:** Paul and I were talking to John O'Reilly last week about this and the sense I get from talking to him and some of the other research councils is that some are more interested in joining such a forum than others.

**Q308 Chairman:** Have they got that privilege, to make that decision?

**Mr Lowcock:** We would be glad to have everybody.

**Q309 Chairman:** Well, make them, please.

**Mr Lowcock:** We will take that steer. I think the point that John O'Reilly made was the one you have just reflected back about the scale of the activity they have which is relevant. From our point of view, the broader the group the better.

**Q310 Dr Iddon:** What about industrialists?

**Mr Lowcock:** Well, we had a discussion. We are involved with GlaxoSmithKline on developing this new combination drug for Malaria, Lapdap it is called, which is being trialled in Africa this year and that is a good example of an industrial interest which ought to be reflected in this.

**Q311 Dr Iddon:** Again, I am back to the question of resources. I think it is a wonderful idea, setting up this funders' forum to co-ordinate activity in this area, but what about the resources? It is going to take resources. Have you allocated any resources for the funders' forum?

**Mr Lowcock:** The main resource that we will need is time, I think. We are, as you know, in the process of increasing the staffing of the research department. We are moving from seven professionals to 17 through a recruitment process. A big emphasis in the strategy is the set of relationships we have with others and we will be putting staff time into managing those relationships, particularly with the funders' forum.

**Dr Iddon:** Thank you.

**Q312 Geraldine Smith:** Have you been pleased with the results of DFID's concordat with the MRC?

**Mr Lowcock:** Yes.

**Q313 Geraldine Smith:** What lessons have emerged from the evaluations that have taken place from that?

**Mr Lowcock:** We invited the Swiss Tropical Diseases Institute, I think it is called, to help us evaluate that experience and we have been pleased with the progress that has been made on the work on HIV microbicides. We have had collaboration with the MRC and various other bodies in the UK for 10 years or so now and it has covered a wide range of areas. We would like there to be a stronger emphasis in our collaboration in the future on things which recognise the state of health services in lots of developing countries and in particular shortages of personnel, constraints on recurrent budgets, so things that we are developing through collaboration with the MRC and others really recognise the position that developing countries find themselves in.

**Q314 Geraldine Smith:** Are you planning similar collaborations with other research councils and the ESRC?

**Mr Lowcock:** We certainly would like to strengthen our relations with the other research councils. We are open to a discussion on whether there should be concordats. As you know, there are restrictions

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under the legislation we operate under which affect the terms on which we can allocate money to organisations. For example, last week when we were at the BBSRC we agreed with them that they would join the steering panel for our evaluation forthcoming on our natural resources research programmes and that we would also organise for them some time with the consultative group on international agricultural research. I think there is a range of ways in which we can collaborate and we are open to a discussion about whether a concordat or some other system is best in each case. I suspect it will vary from case to case actually.

**Q315 Chairman:** Why has this not happened before then? What has caused it to happen now? It seems to me it is an obvious thing that should have happened years ago really, is it not?

**Mr Lowcock:** I think the MRC case goes back 10 years or so and the department over that period has had a strong focus on things that are also of interest to the MRC and its bodies and that has been growing over the period. We did at one stage have collaboration similarly with some of the other research councils. To be honest, I am not exactly sure of the history of why some of those fell away. The position we are in now is that we want to invest more staff time in particular in strengthening that collaboration.

**Q316 Chairman:** I do not think a phone call done the line to a research council is enough, frankly. Maybe you should contact them eyeball to eyeball about these issues. They are quite available for collaboration. They are talking to each other even now, research councils, which is really revolutionary!

**Mr Lowcock:** Quite so, and that is why we went to Swindon last week. We are seeing Professor Blakemore later this morning. I am looking forward to seeing Professor Lawton, I think it is the week after next. I agree, we need stronger collaboration between us and the set of institutions who are interested in this broad agenda.

**Q317 Geraldine Smith:** In your research strategy you talk about the need for better co-ordination between international donors but you do not actually say how you can achieve this, so could you perhaps give us some ideas of how you think you could promote that co-ordination and harmonisation?

**Mr Lowcock:** Well, in the research area there is a global forum for health research which is linked to the World Health Organisation. We want to strengthen their role in co-ordinating globally. There is in the agricultural area a global area for agricultural research run by the Food and Agriculture Organisation. We also are strengthening the links we have with other countries' organisations like DFID. Paul was at a meeting with his counterparts in the Netherlands, I think, last week to strengthen those links and I think there is a weekly telephone conference call to keep people in touch.

**Q318 Geraldine Smith:** What about the other aid donors? Do they share your views? Do they share their experience about aid provision?

**Mr Lowcock:** The set of donors is a Catholic group. In the research area we have consulted, for example, our Dutch colleagues and our Canadian colleagues who work on research and what they have said to us about the strategy is that they find themselves on a similar page. Not all donors finance research to the same level. I think that we are third in the league table of the donors financing research. So we will focus our efforts, I guess, on those bits of the international system who are most interested in this agenda.

**Mr Spray:** I just wanted to add that one area which is particularly interesting at the moment for us is collaboration with foundations, the Wellcome Trust, the Gates, and so on in a whole number of areas.

**Q319 Dr Iddon:** Why then has DFID in the past apparently refused to support the global forum for health research?

**Mr Spray:** That floors me completely.

**Q320 Chairman:** How long have you worked for DFID?

**Mr Spray:** I have worked for DFID since 1997. We attend the global forum for health research regularly. We regard ourselves as big supporters of it. I will obviously have to get back to you on whether there have been funding requests which we have turned down.

**Mr Lowcock:** Health is one of the areas that the department has the strongest focus on. I think we are the second largest doner, for example, funding work on HIV/AIDS and we have this big programme of public-private partnerships to develop new technologies on health. So there are some other areas where we do less—the power sector, the transport sector—but health is really an area where we have made a big investment.

**Q321 Dr Harris:** When was this draft that has just been published first due to be published?

**Mr Lowcock:** It was published a month or so late, as far as I recall. I think we were aiming to publish it at the end of April.

**Q322 Dr Harris:** My understanding was that it was due to be published originally, the timetable, in December 2003, but I thought you would know.

**Mr Spray:** The original timetable was indeed to publish in December, from which two things happened. One was that I had pneumonia, which knocked me out for a month, and the other was that it took longer to do the internal consultations within DFID than we had expected, in part because it was attracting more high level attention and required a lot of iterations, which from my point of view I thought was quite helpful.

**Q323 Dr Harris:** So how many versions of this have there been, lots?

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**Mr Lowcock:** I think there have been three main versions. We have had three sets of comments from the Office of Science and Technology, Sir David King and his colleagues. There has been work in progress between those three main versions, if you like, but I think there have been three main drafts.

**Q324 Dr Harris:** What was the thrust of the OST's comments? Have they been seeking a particular move and you are in a compromised situation?

**Mr Lowcock:** They have made a number of detailed comments. I think what they have been saying to us is that they are broadly encouraged by the direction of this. They have made some specific suggestions. I remember, for example, in the draft before this they asked us to give a greater emphasis to sun-setting, in other words being ready to withdraw from research programmes which were not being as successful as some of the others. Paul may remember some of the other more detailed comments.

**Q325 Dr Harris:** It is not so much the detail. It seems to me that taking three drafts to the OST and getting comments still suggests that they are really thrusting at a point they are not getting joy on, because there is no reason why they could not have raised all the points they wanted to raise on the detail on the first draft.

**Mr Lowcock:** Well, what Sir David King has said to us is that he is encouraged by the way this is developing.

**Q326 Dr Harris:** Right, but that was not my question. My question was, what were their major disagreements and what was the OST's major problem with the earlier drafts? There must have been something if it has gone back three times for further comment.

**Mr Lowcock:** Well, we were working on it not just with the OST but others as well, so we were developing strands of it and the focus of it over that period. For example, we consulted a lot internally within the organisation at various stages on it. We sought the views of one or two big international foundations. We sought the views privately of our Canadian counterparts and our Danish counterparts.

**Q327 Chairman:** Why do you not have a chief scientific advisor? It has been said since 1997 that indeed every department that uses scientific knowledge should have one. Was that the sticking point? Why did you need to review that? Why did you not just do it?

**Mr Lowcock:** We are, as you know, now conducting a review of the way in which the department accesses science and technology advice. One of the issues for us is that we have about 200 professionals in the areas of engineering, health, natural resources and the environment. We have heads of professions in each of those areas and one of the questions is, if we have a chief scientific advisor (which this review which David King is helping us with is looking at and has nominated Professor Beddington to be a member of the team) how would that person relate

to the structure? I think that is a really important question for us because given the number of different disciplines and the number of professionals we have and the decentralised nature of the organisation, unless we get the role of such a person right we could end up with something which does not deliver—

**Q328 Chairman:** How will you know when it is right? Do you wake up one morning and say it is right? How do you ever know in this complex world that you work in when it is right? Why do you not just suck it and see?

**Mr Lowcock:** Maybe when we see what the advice from the reviewers is that is what we will do, but I do think it makes sense to try to think through the role of such a person and how they relate to other parts of the organisation at the beginning. We began this review, I think, last month and it will be reporting next month, so it is not something that we are planning to drag out over a long period.

**Q329 Dr Harris:** You have mentioned several times this issue of internal consultations and re-drafting and interest from a senior level within the department. How well do you think you have consulted with and taken on board the views of external people in devising this research strategy?

**Mr Lowcock:** The number of external people we have consulted in detail on this draft or the earlier draft is limited. As you know, we did a study in 2002 which looked at some of these issues. We then did a follow-up series of pieces of work in 2003. The purpose of the consultation period, which the Secretary of State launched when he spoke at the Foundation for Science and Technology the week before last and which lasts up until July, is to broaden the range of external people with an interest who have an opportunity to comment. So we do hope that through that we will get additional improvements both on the topics of research and on the ways in which we work with others.

**Q330 Dr Harris:** Are you concerned that there is disquiet and upset about people feeling there has been inadequate consultation on this draft, given all the efforts you have done with the OST and three drafts? A lot of people think that this is not going to change very much or significantly enough, so are you concerned that there is, as we have heard, upset and alarm that there has been what they feel is inadequate consultation with key people outside the department to this draft?

**Mr Lowcock:** The feedback that we have had so far on this draft has been broadly encouraging. The purpose of the consultation period clearly is to elicit what range of concerns and worries people have and we are consulting because we are ready and keen to make further improvements to this.

**Dr Harris:** You say you think you have had positive feedback but we have not. I have a collection of comments here that I have prepared. From one evidence session, "There is alarm that this whole process of the review of the research strategy is taking place behind closed doors with very little consultation with many of the actors who have

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enormous experience. There is a sense of outrage that the only way in which we have been consulted in this process was to ask for our big ideas." Another person was saying, "I do not think that they [our ideas] have been taken into account anywhere near adequately." That does not seem like positive comments from what we have had. Have you just not heard that?

**Q331 Chairman:** I have heard that. You have really stuffed the chief advisors. You have downgraded their positions to heads of profession now, have you not? You have made decisions which fit in with the behind closed doors philosophy we are putting to you.

**Mr Lowcock:** On the question of the broad reaction to the consultation document, we had concerns expressed to us before we put this draft out, some of which we hope to address through this draft. As I say, the reactions we have had so far have included some encouraging comments. For example, the deputy chairman of the Foundation for Science and Technology said he was extraordinarily impressed with DFID's approach to get down to basics. The head of a major international foundation said that we had done an excellent job of creating research plans strong in science and technology.

**Q332 Dr Harris:** This is one of the foundations you consulted that you mentioned earlier?

**Mr Lowcock:** Yes.

**Q333 Dr Harris:** Yes. I think there is an issue about the people you did not consult being unhappy. It is not surprising, perhaps, that the people you consult are going to give you positive comments.

**Mr Lowcock:** Quite so, and that is why we have now had this consultation period.

**Q334 Chairman:** Why have you downgraded them? What is your game?

**Mr Lowcock:** In terms of the seniority of this group of people it is not the case that we have downgraded them. What we have done is integrated them back into the policy and managerial bit of the department, if you like.

**Q335 Chairman:** What do you call them now then? Have they new titles?

**Mr Lowcock:** Yes.

**Q336 Chairman:** Have they new job descriptions? Have they new salaries? Are they safe in their positions?

**Mr Lowcock:** I do not think any of them has a new salary. I think perhaps one has a new salary. We continue to have a chief economist, who is the same person as it used to be. We continue to have a chief environmentalist, who is on the same terms and conditions as he used to be. He has a role which is more focused on the environment now than it used to be. We have a total of 11 senior civil servants who are heads of these disciplines and we have also some more senior staff who are working with them on the policy managerial issues.

**Q337 Chairman:** So what are their names? Heads of policy groups and heads of profession, are those the two groups we are talking about?

**Mr Lowcock:** Yes.

**Q338 Chairman:** So the policy group are senior to the heads of professions?

**Mr Lowcock:** Some of the chief advisers, if you like, for example the chief economist, are heads of groups. So it varies across the piece, but yes. The head of the human development group, for example, has working with him and reporting to him the head of the health profession, who is a physician, and the head of the education profession.

**Q339 Chairman:** It sounds to me as though you have got more heads than the wives of Henry VIII actually!

**Mr Lowcock:** As you know, there is a high proportion of the staff of the department who are professional advisers. Something like a quarter of our UK-based civil servants are in our professional advisory disciplines. We think this is a strength of the organisation. As I say, 200 or so of these people are from the sciences, broadly understood.

**Q340 Dr Harris:** Going back to this research strategy, you have not formally consulted with the users, the end users if you like, of research in developing countries. That seems strange because you talk about a demand-led agenda and the demand is coming from those users. How can that be justified?

**Mr Lowcock:** I agree that that has been a problem with this. We do in a kind of intermediate way, for example through the advice we get from organisations like the consultative group on international agricultural research and through our own professional advisers, most of whom are based overseas and spend their lives working with developing country counterparts, seek to get those views out. One gap internationally actually in the system for managing and co-ordinating research is of fora which are led by and have a heavy voice for developing countries and I do think this is an area where we need to think a bit more and maybe the international system needs to ask itself whether the structures are quite right for hearing the developing country's voice.

**Q341 Dr Harris:** I understand that and that applies to presumably other funders, but the DFID has these country offices which it is so proud of. Can it not use those to formalise a consultation process at an early stage so that these ideas can be fed in at an early stage and it will be felt to have been fed in? I do not understand why you would not want to use those staff who are close to the ground in those countries formally.

**Mr Lowcock:** I think that is an idea we can look at. The views that our staff overseas have fed into this will reflect what the agricultural research or the science and technology institutions or the medical professions in the country are saying to them, but yes, I think it is something we can certainly look at.

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**Q342 Dr Harris:** Do you agree it is a double problem, because firstly there is an issue about building capacity and that means putting research funding into areas where there are the people on the ground in developing countries where capacity can be built, and secondly there is the issue of them knowing and having ideas about what research is needed? There is a double imperative and I am surprised we are so far along this process without something having been done.

**Mr Lowcock:** This is one of the things we have given greater emphasis to in the strategy. We do want to strengthen our links and our responsiveness to what developing countries are saying. We do believe that the main areas we have outlined in the strategy are ones that have a high degree of resonance for the reasons I outlined earlier in answer to Ms Smith. Nevertheless, it is important that we continue to work harder at. I accept your point. We need to work harder at hearing the voices of developing countries.

**Mr Spray:** I just wanted to say that that is absolutely right at the high level, the overall strategy level. One thing I think we can point to some success in is in our individual programmes, listening to the voices of users, farmers or whatever, and that is something we want to take forward. For example, one of the important things is the evaluation we will be doing this year of our natural resources research over the past 10 years and one thing we want to look very closely at is how have they managed, as they have a whole variety of very impressive ways, to listen to the voices of farmers and actually produce the crops or livestock advances that farmers themselves need. So at the next level down I think we are better than at the top level.

**Q343 Chairman:** I want to ask you a question, Sharon. You have got to manage some people, chief advisers and so on. How is their role going to change? Have you thought that through yet?

**Ms White:** Yes. On the new structure that Mark outlined the great benefit is that it brings together the functions of the chief advisers, who, to be frank, over the last year have been somewhat detached from our policy work. They have been technical advisers but they have not had line management responsibility. So it brings together their functions with the functions for managing and delivery on the policy into one integrated structure. So for me the key is that we have got five thematically coherent policy groups, including one group of sustainable development, which will cover issues to do with the environment, natural resources and so on, headed by strong managers and the heads of group, who have also ideally got a policy or technical background. Then they will be supported by heads of profession, who are the technical experts in their areas. So what we hope to do is to get the best of both worlds, which is to have policy managed in a multidisciplinary way but also to retain our strong technical base in the subjects that we have developed such an expertise in over the years.

**Chairman:** Okay. Thank you.

**Q344 Mr Key:** Could I turn to the question of monitoring the evaluations. I think it is very important to set all this against the background of the considerable success of DFID over many years, I would not want to belittle that at all, in vaccine, oral rehydration therapy, new crops, pesticides, and so on. Nevertheless, I am concerned that we have been hearing from some of our witnesses that they think DFID is not taking stock of past experience in funding research. What mechanisms have you got in place now to improve your ability to learn from past experience?

**Mr Lowcock:** The standard evaluation monitoring systems we have across the whole of DFID apply in this area so every year for any investment in which we are committing more than £1 million we rate its success in achieving its objectives. When we stop spending money on it we rate its success again. Then we have a programme of *ex post* evaluations. In the research area, in addition, we carry out from time to time an independent peer review of some of the programmes that we support. An example I gave earlier was inviting the Swiss to help us review progress and success of the MRC collaboration. We have, in the natural resources programmes, programme advisory committees which help us evaluate the success of those research projects and we involve in that leading international experts. We had Professor Sir John Berringer recently help us look at the way we are taking account of GM issues in the natural resources research programmes that we finance. We do think that we need a stronger effort on monitoring and evaluation and this is consistent with the emphasis we put in this strategy on generating a bigger uptake, a better uptake and use of technologies or the knowledge that we helped finance the creation of. That is why we intend to devote more resources to that.

**Q345 Mr Key:** I note that in the DFID research funding framework document monitoring and evaluation is the very last item and some people might think you perhaps should start by establishing where you are and where you went wrong. Nevertheless, it is the last item, paragraph 61, and you say there that there will be regular monitoring, etc, in order to sunset research teams that have run their course and I am pleased to see that it says, "This will build on a positive experience of monitoring built up in DFID's past programme, extending it by greater DFID staff input." How much greater and how many more staff?

**Mr Lowcock:** The total staff in the research department is roughly doubling. I am sorry, the total is not doubling but the professional area is more than doubling, from seven to 17. Maybe Paul could say something about what proportion of those resources will go on the monitoring evaluation. I think the broader dissemination is also related to this.

**Mr Spray:** Six of the folk will be research managers and then there is a number of others who are professional advisers in health or agriculture, or whatever. Those research managers will have a responsibility for managing the entire project

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cycle, as we call it, starting off with the appraisal but then monitoring the programmes throughout on an annual basis and then an evaluation. We have a requirement for independent peer review at various points in the process. It may be worth saying that we are recruiting people now into these research manager posts, highly qualified people—two with a health background, one with an agriculture background, one with an agriculture economics background, one with a communications background. So I am very hopeful that we will be able to carry it right through and we see the evaluation as a really important part of the full cycle, so that you want to learn from the evaluation to design a new programme.

**Q346 Mr Key:** Could I ask the question in a different way to see if I can get a specific answer to it. You say there will be greater DFID staff input. You have said there are going to be 6 people who, as part of their role, will do some evaluation in addition to everything else they are doing in managing and research. That does not sound like an awful lot of people considering the size of our research project.

**Mr Spray:** They will be commissioning evaluation generally at the end of programmes such as this agricultural one that is just happening now.

**Mr Lowcock:** Could I add that we also have a central evaluation department, as I think you are aware, and we are in the process of doubling the resources in that department. One of the things they will do is help us look at the evaluation effort on the research programme.

**Q347 Mr Key:** Where does that evaluation unit fit into your wiring diagram which you have kindly provided us with of the policy division because I cannot see in anywhere?

**Mr Lowcock:** It is not part of the policy division, it is an independent unit which reports directly to me because one of the things about evaluation is that we do not want its independence to be reduced by too close a set of links with people who are spending the money on things.

**Mr Key:** How many staff are in it?

**Q348 Chairman:** How can it be independent if it reports to you?

**Mr Lowcock:** Well, it is independent in the sense that I do not supervise most of the expenditure in the department. The country programmes report to another senior manager and our multilateral assistance programmes report to another senior manager.

**Q349 Mr Key:** How many people are in this unit?

**Mr Lowcock:** Perhaps we could write to you with the detail, but it is something like 20 and again it is an area where we have been hiring new staff—

**Q350 Chairman:** You keep saying “roughly” and “something like”. You should know this precisely, surely, if you are the boss?

**Mr Lowcock:** The reason I do not know precisely today the number of staff in the evaluation department is that we are hiring them. I will write to you with the precise details as of today and the number we are aiming to get to.

**Q351 Mr Key:** Where will they be located, in London or East Kilbride?

**Mr Lowcock:** They will be located in East Kilbride.

**Q352 Mr Key:** How much of a problem is it that the department is split between London and East Kilbride?

**Mr Lowcock:** It is not a problem. We are split in 60 places around the world. Most of the people who work for the department do not work in the UK. We have an excellent communications system. We have won an industry prize for our video conferencing system. We believe that split locations is not a problem for us.

**Mr Key:** I have visited the East Kilbride department—

**Chairman:** And survived!

**Q353 Mr Key:** — and indeed survived and I understand the disadvantages too from officials who move up to East Kilbride and then have to move back to London and are caught in the housing trap, which is a very big problem. How do you overcome that?

**Mr Lowcock:** We are, as part of the Government’s broader programme of relocating public sector jobs from the south-east to other parts of the country, in the process of relocating about 85 jobs at the moment, including a number of jobs from Sharon’s area. Part of what we are trying to do there is to provide a broader range of careers for people in East Kilbride so that they do not have to come back to London; they can have careers which are based between East Kilbride and our overseas offices.

**Mr Key:** Thank you.

**Chairman:** I can imagine staying in Scotland is a much better quality of life than coming back to London!

**Q354 Mr McWalter:** The Natural Environment Research Council has given us some evidence and it says, “the hands-off and disassociated relationship between DFID and the UK science base in general and specifically in the context of agriculture and allied sciences, creates a poor institutional environment for effective acquisition and use of scientific outputs and advice.” Are they wrong?

**Mr Lowcock:** As I said, we want to strengthen our links and relationships with a range of institutions including British institutions. We have doubled the funding we provide to the consultative group on international agriculture research, another £30 million over the next three years. We believe that it is very important, especially in the natural resources area, that we have strong links with institutions and organisations in the countries in which we are working as well as good links with institutions in the UK.

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**Q355 Mr McWalter:** The Royal Academy of Engineering has not even bothered yet to submit evidence to this inquiry and last night I had a meeting with the Engineering and Physical Sciences Research Council from which it is very clear that you never asked them to do any work really, or hardly ever asked them to do any work. Why not?

**Mr Lowcock:** We finance something like 200 research projects in the areas of energy and transport technologies. There are a lot of organisations that we do work with. The honest answer is, I do not know what set of links we have with the Royal Academy of Engineering. I would be very happy to go and chat to them and get their guidance and views on strategy.

**Q356 Mr McWalter:** Dr Adrian Newton of the School of Conservation Sciences in Bournemouth says: "For an organisation that has invested so heavily in research in the past, it is strange to encounter within DFID a widespread lack of understanding of the value of research and what it can offer." Do you want to comment?

**Mr Lowcock:** We would not accept that we do not value research. The reason why we are increasing our funding for research both centrally and through the country programmes, where we currently have something like 140 projects which are principally being done because of the contribution to research, is because we do value it.

**Q357 Mr McWalter:** The Royal Society says: "We consider a significant level of in-house scientific expertise within DFID vital to facilitate the co-ordination of research and important to provide a channel from the results of research programmes to inform the policy making process." Is their concern unjustified?

**Mr Lowcock:** We agree that we need a considerable level of scientific expertise. We think actually we do have some capacity but we are also increasing it.

**Q358 Mr McWalter:** One of the things I want to see when we do an overseas visit is to look in detail at some of the engineering work that DFID is doing, but they were not doing any in Malawi. Is that surprising?

**Mr Lowcock:** The things we do in each country are determined by a dialogue we have with the government of that country and what the other donors are doing. As you will see, we are doing a lot in the natural resources and health area. We are doing research on the set of engineering broadly understood issues in other countries and we would be very happy to give you more examples of that.

**Q359 Mr McWalter:** So when the chief of the Natural Environment Research Council said to us, in response to various issues we were raising with him about the absence of large numbers of activities which should be going on, "I'd talk to somebody in DFID if I could find somebody sensible to talk to," he was wrong, was he?

**Mr Lowcock:** I am due to meet Professor Lawton the week after next. He has been in correspondence with ministers. It is the case that, for example, in the power sector and the transport sector DFID does not do as much work as we do in some other sectors. This goes back to one of the points I was making earlier about it being desirable for there being some division of labour between donors. So on power and transport we have increased by 50% our contributions to the World Bank. They do a lot of work in those areas. A quarter of our departmental budget goes to the European Commission. It is one of the major financiers of, for example, road infrastructure, especially in Africa. The Japanese government has a very big focus in its aid programme on the power and transport sectors.

**Q360 Mr McWalter:** So overseas countries do not really need our engineers then, they have Japanese engineers instead?

**Mr Lowcock:** The question for us is not just where the expertise comes from. We are keen to help ensure that from the variety of sources available to them developing countries can get their priorities for assistance met. In some places we are involved in, for example, the water sector. Paul gave an example earlier and we can give other examples in Uganda or other places. But the principle that it is desirable to have a division of labour between donors and that what we as an organisation do in any particular country should reflect a dialogue between us and the government of that country does seem to us to be an important one.

**Q361 Mr McWalter:** But you do not need scientific expertise at all if you are just basically saying, "Well, on the whole our strategy is to give them the money and let them decide themselves." If that is your job, you do not need scientific expertise, do you, much?

**Mr Lowcock:** We do. A big part of our programme is technical co-operation, technical assistance. The budget support in recent years has been running at about 15–20% and we do think that the technical collaboration is very important. That is why we have these more than 500 specialists in the professional areas.

**Q362 Mr McWalter:** From officers who are generally at about the third level in your pyramid. Not that many of them are at the top level. How many of you lot have got science degrees?

**Mr Lowcock:** I do not think any of us has, but the head of our programme in Iraq has a PhD in ecotoxicology. Our most senior official in Geneva working with all the UN agencies has a PhD in reproductive health. The person who runs our programme in Ethiopia is a vet by profession. The woman who is in charge of our programme in Tanzania, about to be DFID's most senior official in the World Bank, started life as a health professional. People with a range of disciplines get

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into senior parts of the organisation. They might start in a professional discipline but they get to lots of other places as well.

**Q363 Mr McWalter:** So there is not a lack of appreciation of the value of sciences in DFID is what you are saying?

**Mr Lowcock:** We believe that science and technology makes a big contribution to development. We will put more money into those areas than we have in the past. We are also keen to try to make sure that there is better uptake of today's science and technology to help solve the problems of developing countries.

**Q364 Chairman:** Are those conclusions you have made from the review that you are undertaking?

**Mr Lowcock:** The review that we are undertaking actually is on a narrower question of how in the department we structure ourselves to get the best access and make the best use of science and technology.

**Q365 Chairman:** And what have you discovered?

**Mr Lowcock:** Well, I have had one meeting so far with the review team. Professor Beddington and his two colleagues will report next month and I think when Hilary Benn comes before you in July he expects to be able to say more about both what we have discovered and what we propose to do.

**Mr McWalter:** My feeling is, if you take Mozambique, which is a Commonwealth country, the beautiful port of Beira has got various hulks of rotting ships in it. You need some heavy engineering, some marine biologists, some civil engineers and Beira might go back to being where it was, a source of revenue and wealth and something which actually generates resources for the economy of Mozambique. That is scientific expertise, not money, although money is important to employ it. I just have the feeling that when we raise these issues with you there will be a series of consultations about who is doing what, where and how and so on, but I do actually believe that DFID will ever remove one of those rotting hulks from that port. I do not think it will ever happen and I do not know why, but I do know that lots of conversations about who is doing what and whether the Dutch are on board this year and whether you have got a tele-conference somehow or other might not get it done. Equally, it might not get it done if you have your research strategy rather than a problem based research strategy that says, "Some things we might just be able to sort out quite quickly," and that might actually make a huge difference to the quality of life for thousands of people.

**Q366 Chairman:** The question is, is that right?

**Mr Lowcock:** It is unfortunately the case that in the nature of the work that the department is trying to support the scale of needs is vastly greater than not just we but the international system as a whole can do. We spend our professional lives receiving requests of exactly that sort and trying to work out

what is the best way as an organisation for us to respond. We can point to successes the department has had in progress towards the Millennium development goals. You will find when you go to Malawi that 10 years ago in Malawi one child in four did not survive until her or his fifth birthday. Now in the last 10 years that appalling statistic has been reduced somewhat to about one in a bit less than five. The department has been spending £10 million a year or so on support for programmes which have contributed to that result. Likewise, to take a country like Uganda, Uganda has reduced the poverty level from 56% to 35% in the last seven or eight years. The number of kids in school has increased from 2.5 million to 6.5 million. The HIV/AIDS rate has fallen from 14% to 7%. They have had a decade of 7% annual growth. That has been substantially supported by external assistance, of which Britain is one of the main financiers. So yes, I share your unhappiness that there are so many problems in developing countries where there were there more resources, more people or more time we would be able to do things to tackle. But we do believe that we make a significant contribution through the things that we are able to do.

**Q367 Mr McWalter:** I could forgive this if what you said was, "Well, you know, there are 200 of those programmes and we can only finance two of them," but I was talking the other day to the director of the Kigali Institute of Science and Technology about water and sewage management in rural Rwanda and I get the strong feeling that there are whole areas where we would absolutely not be able to do anything at all, that engineering is off the map largely for us. That seems to me to be, for a country which has had historic strengths in that area, deeply disappointing.

**Mr Lowcock:** As you know, we fund the Kigali Institute.

**Q368 Mr McWalter:** They have been asking for £5.4 million for a joint enterprise with the Glasgow Caledonian University now for four years to deal with particular issues about water and hygiene and it is no nearer now than it was four years ago.

**Mr Lowcock:** We have a significant programme of assistance to Rwanda, the uses of which are determined by discussion between us and the government of Rwanda. It is a country which over the last 10 years has had the world's second fastest rate of economic growth. Since 1994, with the appalling genocide, it has made substantial progress. Britain has contributed to that. I think we are the largest or one of the largest bilaterals. I agree with your point that there is also a lot of other things that we do not do. We do think that there is a division of labour issue and I gave the examples of the transport sector and the power sector; not that we do not do thing there, but we do not do as much as we do in some other sectors or as much as some other donors do. Water is an area which the National Audit Office actually examined our work in last year and produced a report on. It is of course the case, as in so many



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other areas, we could do more work there, but basically what the NAO found was that we could point to successes in what we do in the water sector. They found that we have some good examples of research and also, importantly, that we need to work hard to get that research on water disseminated better, one of the points which has fed through to the focus we have put in this strategy on monitoring valuation dissemination.

**Q369 Chairman:** How would you describe the relationship between the policy advisers and the researchers at the moment, the contact between them in using the research that is available? Is it close, it could be closer, a lot more needs to be done? How would you describe it at this stage of the process?

**Mr Lowcock:** One thing I would like to say about this central research strategy is that it is trying to contribute to the global pool of knowledge. So the main test for us is not whether the DFID country programmes are picking all this up, because we are aiming at a bigger prize here. We are trying to get research taken up by the whole system. We can point to some examples of where people in the country offices have said, "We have got this problem and we need some research help with." There is the water hyacinth case, which was publicised in the press and you are going to see—

**Q370 Chairman:** I intend to be a world expert in that when I am finished! I am really interested in it.

**Mr Lowcock:** It is a very interesting case actually because with the previous technology the chemicals and the mechanical attempts to deal with this were not winning. The introduction of a biological process and the rolling out of that has been a positive experience. There is now, as you know, this issue over grass weeds, which is a different problem, where again we will have to have a discussion with the Malawian government about whether there are things we can do to help with that. There are other examples as well of cases where the country offices

have said to Paul or his colleagues, "Look, we've got this problem. What can you point us to which will help address it?"

**Q371 Chairman:** Let me just bring it all to an end by inviting you to say anything you would like. We have been giving you a buffeting, which is our job, I guess, but at the same time we want to pick up ideas from you. Have we missed anything, any tricks that you would like now to expose or any new problems that you would like to raise with us? Is there anything more that we should be doing? This is your chance.

**Mr Lowcock:** Thank you. I think one of the real challenges for us is to work out what the right niche, if you like, is on the research and science and technology, the extent to which we should have a strong focus on the kind of hard science, which I think some of your witnesses have put some emphasis on, as opposed to the extent to which we should be driven largely by the farmer or the patient. I think our basic view is that for DFID as an organisation a strong focus on the demand side is quite important because we have this network of country offices, we have these international relationships and so on, but one thing we will be interested in in your report is the judgment you form on that balance.

**Q372 Chairman:** Yes. I think we have picked that up. It is a very difficult area to have any hard and fast presumptions about. I think we are just learning as we go along and each time we meet. Can I thank you for coming. Sharon, I am sorry, did you want to say anything?

**Ms White:** No, thank you.

**Chairman:** Paul, you do not want to sum up? We have seen you quite a few times recently. Thank you very much for taking your time in coming and helping us. I think we both are in the same position; we can do better and we are trying hard and in that sense we are working together. Thank you very much indeed for your time.

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**Wednesday 9 June 2004**

Members present:

Dr Ian Gibson, in the Chair

Dr Brian Iddon  
Mr Robert Key

Mr Tony McWalter  
Dr Desmond Turner

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*Witnesses:* **Mr Peter Cameron**, Chairman, Appropriate Development Panel, Institution of Civil Engineers, **Dr Andrew Cotton**, Senior Programme Manager, Managing Director, WELL Resource Centre, Water, Engineering Development Centre, Loughborough University, and **Professor John O'Reilly**, Chief Executive, Engineering and Physical Sciences Research Council, examined.

**Q373 Chairman:** Good morning. Thank you very much for coming to help in what is turning out for us to be a really interesting inquiry. We have you here to help us unravel some of the problems in the engineering sector and how DFID and so on interact in the developing world. You will be followed by people in health, and next week we are off to Malawi to inform ourselves of what really does happen at grass roots. We are beginning to feel that DFID have had a reawakening, that science and technology in that sleepy hollow has suddenly come alive again. It has been a pretty low effort, if at any level at all that is worth recording, and I think the Department stands indicted if that be true. Am I talking out of turn here? Is the picture you are seeing that there are changes taking place? In reaction to inquiries or whatever causes, is something changing in DFID? Do you pick it up? Do you hear it through the grapevine, in the pubs and clubs?

**Professor O'Reilly:** There are three of us, Chairman, and we come from separate organisations. Would you like us just to run along.

**Q374 Chairman:** Yes, I think so. On a question like that, we will do that.

**Professor O'Reilly:** Okay, then you can play us as you wish. For the record, I am John O'Reilly, Chief Executive of the Engineering and Physical Sciences Research Council.

**Q375 Chairman:** We have your biography, John.

**Professor O'Reilly:** Indeed. From the EPSRC perspective, with regard to both DFID and the developing world research, I would say there is very limited direct interaction for EPSRC but, in large measure, that is dictated more by the nature of our remit and our specific mission than any observations I would make elsewhere—and let's recognise that that could be quite different for other research councils, where their missions may well align or the research itself may align. In terms of our specific programmes, it is in the infrastructure and environment programme where there are potential synergies, and there have been discussions and interactions with DFID largely in terms of making sure about awareness and so on, that they are aware of the strengths. In terms of EPSRC-funded researchers, we do know—we have checked—that there are significant activities, collaborations, interactions with developing countries, although our

funding is not doing that directly. The area for development I would say probably is in the post-graduate programmes of training for the future. From some of the discussions I have had with DFID, that is where we may be able to open up things very positively.

**Q376 Chairman:** If I were to say there is nothing going on, I would not be far amiss.

**Professor O'Reilly:** If you said: "Does EPSRC collaboratively with DFID fund in developing countries?" I think you would be right, inasmuch as that is not primarily what we do. The answer in that sense is no. But you would be wrong if you were to say that there is not good awareness and good interaction.

**Q377 Chairman:** You are not interested really in this whole area.

**Professor O'Reilly:** If you look at the EPSRC mission and our remit, there is not a direct link there, there is an indirect link. There are some good interactions in areas of flooding. Water is one area where there are synergies and so on. As you rightly say, Chairman, we have recently been talking yet more strongly to DFID because the structures make that possible. To say "not interested" I think would be wrong. "Is there a fit?" is the issue.

**Q378 Dr Iddon:** The Director General of the Research Councils, Sir Keith O'Nions, said that the research councils "must have a part to play" in research for international development. The MRC do it, the ESRC do it, why does your research council not do it?

**Professor O'Reilly:** It depends what you mean by a "part to play". My point there is that the nature of that interaction is going to be different. In the case of MRC, the research itself takes place in the developing countries because what they research on is there. In the case of EPSRC, it is more the products of the research that will have relevance to the international development agenda rather than that we would go there to do our research.

**Q379 Mr McWalter:** Managing Mozambique and the floods, say, is not an interesting problem that would require the most extraordinary engineering expertise?

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**Professor O'Reilly:** From my perspective, it would be an interesting case study that would inform the generic research on flooding in which we are engaged. Indeed, the flooding consortium that we have jointly with the NERC and with DEFRA and so on is a good example of that. So it is "relevant to" but it is not "go there and do the research there" from an EPSRC perspective.

**Q380 Mr McWalter:** Each flooding system has a different geology and different flow characteristics, and a whole range of different new issues get raised if someone is working in the field as opposed to sitting in Imperial College designing mathematical models. Is there not something to be said for that kind of research as well?

**Professor O'Reilly:** Yes, there is, and that is what I meant by saying it is a relevant and an appropriate case study that would link into the generic research that the EPSRC would more reasonably fund. It is not an irrelevance, it is not a lack of interest in any sense whatsoever; it is: "Where do we fund research and whom do we fund?" We primarily fund, as you know, researchers in the UK, and the problems they address are basic, strategic and applied research. It is in that last end of those where the case studies are likely to be—

**Q381 Dr Iddon:** Would you be concerned to learn that some witnesses have told us that they do not think your research council is interested at all in the developing world?

**Professor O'Reilly:** I would like to explore what they mean. I am concerned of course by the statement but I think we would need to unpick it and see what it means. A lot of EPSRC research is extremely relevant and there are interactions.

**Q382 Chairman:** That is really what Sir Keith O'Nions says—you must have read it: "Given that Research Councils are the bodies that are funding the greater part of the basic science and most of the applied science in the UK—and therefore have access to a massive part of our intellectual wealth and scientific wealth—and if government policy is calling for that to be deployed progressively in international development, they must have a part to play."

**Professor O'Reilly:** I think that is perfectly reasonable, Chairman. I consider that to be compatible with what I have been saying.

**Q383 Chairman:** You are not doing it. We want to know why.

**Professor O'Reilly:** Let me be very clear, Chairman. EPSRC is funding substantial work that is relevant to the developing countries. The researchers that we fund are involved in collaborations and are engaging people in the developing countries, but the nature of the research that we support is more of the generic nature, and then the developing countries provide one set of case studies, just like the Thames Valley might provide another set of case studies. Mr McWalter is absolutely right, these are different, and

it is very helpful to have the different perspectives that help to test the models and so on, but that is the nature of the collaborations that go on.

**Q384 Chairman:** Let's hear from Andrew Cotton and Peter Cameron at this stage.

**Dr Cotton:** My response to your initial comments is that, rather than there having been nothing going on within DFID, it is a question of visibility and profile of engineering and technology based work within DFID. There has been a very innovative Knowledge and Research Programme in what used to be the engineering division in DFID. I would say the issue is the prominence that gets within DFID as an organisation and the way the outcomes of that work do or do not get fed through to country assistance programmes. With the restructuring of the policy division, there is the potential now, through dealing with research in a much more central fashion, actually to build synergies that my personal view would say were not there in the past, where you had quite different streams of research going on with different dissemination strategies.

**Q385 Dr Iddon:** Is that integration the research councils—

**Dr Cotton:** No, sorry, I am talking about within DFID itself, within the different sectoral programmes; for example, health, economics and social science and engineering.

**Q386 Chairman:** What do you think of EPSRC?

**Dr Cotton:** Coming from an institute which works totally in development, we do not interact with it.

**Q387 Chairman:** You have never had a research council grant from EPSRC?

**Dr Cotton:** We have not in my centre.

**Q388 Chairman:** Have you ever applied?

**Dr Cotton:** We applied quite a long time ago. One of the reasons for not pursuing that was that we are basically a self-funding unit and when there are other research programmes, for example the DFID research programme or through the World Bank Water and Sanitation Programme, on which it is much easier for us to focus our proposals, then we choose those.

**Q389 Chairman:** I put it to you that you know quite clearly that EPSRC do not do development, so you do not bother. Is that what people say on the grapevine?

**Dr Cotton:** I will only answer that from my own perspective.

**Q390 Chairman:** Yes, that is what you can do.

**Dr Cotton:** That perspective is of somebody who is working within an academic institution but whose primary focus is on the application of findings to Millennium Development Goals, to poverty eradication. From that point of view, it is very much the development end of research and development.

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So, from that point of view, it is an issue for me about personal interest and interest of the other staff in the institution in which I work.

**Q391 Dr Iddon:** Could I come back to EPSRC for a moment, and ask John: Do you have any interaction with DFID at all?

**Professor O'Reilly:** Yes.

**Q392 Dr Iddon:** At what sort of level?

**Professor O'Reilly:** They are on the scale of exchanging information and awareness more than collaborative-funding of research at this stage.

**Q393 Dr Iddon:** Is that in meetings? Is it formalised in any way?

**Professor O'Reilly:** There have been meetings, as you know, through two main programmes from the EPSRC perspective. One is the programmes, the programme managers and their teams, in terms of interactions and meetings. The second is that EPSRC has over recent years developed a policy of sector teams which look at different relevant sectors, and some of the DFID interests would fall into those sectors. So it is two different ways of getting a perspective. That is the sense in which the development perspective sits alongside those things which are within the UK and so on, and we debate together on them.

**Q394 Dr Iddon:** Would DFID know of all the research that EPSRC are funding that might be relevant to developing countries?

**Professor O'Reilly:** I cannot speak for DFID in terms of what they would know. I can say that they have access to it. We provide that information and, more recently, in some of the interactions, we have drawn to their attention the power of our browsing facilities of our database and have had discussions about sharing that information more intimately.

**Q395 Dr Iddon:** Have you thought of developing a concordat, like the MRC have developed a concordat with DFID? Did you know they had a concordat?

**Professor O'Reilly:** I am not at all surprised that MRC had. Although I did not know this specifically, I would expect them to. EPSRC does have concordats with many organisations, and we have had those discussions with DFID as to the extent to which that would be appropriate and are very open to moving forward in that way.

**Q396 Dr Iddon:** Has your connection with DFID been long-standing or has it come about as a result of recent reforms in DFID?

**Professor O'Reilly:** There are two sorts. There are some long-standing interactions, and those are the less formal ones—although I believe they have been very effective. In terms of flooding and in terms of earthquake engineering—which, incidentally, is an example we have not touched on, Chairman, where there are very substantial EPSRC-funded interactions—then I think there have been but those have tended to be on an individual topic basis. You

are right, of course, that the recent reappraisal provides the possibility of a more formalised framework, and we would be very happy to move forward in that way.

**Q397 Chairman:** Peter Cameron, you have sat here very patiently. What would you say about interaction with EPSRC? What would you say about DFID's changes?

**Mr Cameron:** Let's go back to the DFID changes and how we see DFID. I think, with some apologies, in a way, the paper that we submitted to you does appear to be fairly critical of DFID, but it is, I suppose, as a result not so much of saying "you are not doing anything" or "DFID are not doing anything" but that there is an awful lot still to be done and we cannot just relax. We were very excited when DFID produced its *Making Connections* paper. That is seen to be really attacking the whole root of the world poverty issue and highlighting where the engineering and other sectors need to be focusing, and it stressed the need for very clear, very good infrastructure provision. Delighted as we were to take part in the organising workshops for the *Applied Technologies to Improve Livelihoods* papers that DFID organised in order to formulate their new engineering strategy, a frustration for us was that we were tended to be warned off the word "infrastructure"—as though: that has been done, you have been there, you do not need to do any more about that—whereas in engineering terms, simple engineering terms, infrastructure is so fundamentally important that we must not take our eye off that ball at all. Allied to that, we do recognise there is a lot going on within DFID. A lot of very interesting research projects are being done, a lot of good work. I suppose really, in short, we want more and more of that.

**Q398 Chairman:** Has the amount gone down, do you think, that DFID has been investing in these enterprises?

**Mr Cameron:** We are slightly disappointed with the paper that came out, that the engineering aspects would be evaluated and thought through, and no real strategy for developing that, and that was indicating a slight downturn against other areas which were increasing. But that is looking at the industry as a whole. ICE does not normally receive or seek funding from DFID and, therefore, in that respect, we are probably not able to talk very much about how DFID is funding research—although, of course, it has made a major contribution to our project of Engineers Against Poverty, which is the group formed out of the Telford Challenge, and now we are looking at a new development, Engineers Without Frontiers, which is looking at how the engineering profession can make a major contribution. With that, obviously, we will be looking to strengthen the existing ties with DFID.

**Q399 Chairman:** Do you know our man in Malawi, for example?

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**Mr Cameron:** I do not.

**Q400 Chairman:** I mean, the man who is responsible for the engineering projects?

**Mr Cameron:** But certainly our local representatives would have good links with your country reps, and we need to build on that.

**Q401 Mr Key:** Andrew Cotton, your memorandum actually says, "... a detectable reduction in the emphasis placed by DFID on the role of technology and engineering" has occurred. How have you detected that?

**Dr Cotton:** I would pick up on a point that Peter made where I think he said, "Don't mention infrastructure too strongly when you are in some of these dealings". That was a feeling that we got, for example, through the Knowledge and Research Programme of the engineering division. One of the important things it did was to go for an interdisciplinary approach with engineering-based research projects. My question would be—and I do not know the answer to this—Did other sectoral programmes within DFID make a similar question? In other words, had social science based research programmes made an effort to incorporate engineering views and engineering considerations within that? We certainly felt that we had to keep off too strong a statement about infrastructure and technology being at the forefront of what we were doing. I would add that, in the that work we have done and in our experience, technology and engineering is but one component. It has to be viewed within the institutional, economic, financial, social, environmental context—so it is one of six—but we tended to feel that we were keeping it a little hidden.

**Q402 Mr Key:** Are you confident that people in DFID are competent to assess the role of engineering in their programmes overseas? Do you think they have the right staff? Is it perhaps because they do not have the right staff in DFID that they do not see the importance of engineering and technology?

**Dr Cotton:** Of the staff that I know, the engineering advisors, to a man and a woman I believe them to be highly competent and very good and they have a very good understanding of development. My question would be of the number within the cadre, as to whether you have sufficient given the up-scaling of the overall aid programme budgets to reflect the need for improved infrastructure. So I think it would be more to do with the numbers on their advisory group within engineering that would be of a concern.

**Q403 Mr Key:** I wonder if I could ask all three of you whether you feel DFID is right to focus on the application of access to engineering rather than new technology *per se*. Because that is the impression we get. They are not very interested in promoting new research in technology and engineering.

**Mr Cameron:** It is an interesting question, in that I think there has always been an eagerness, certainly with our contacts with DFID, to promote and look

at new technology. I think it is interesting, though, that DFID have moved away from having an engineering division to having an urban development and infrastructure division, and that tends to suggest to me and to us that the engineering side is more subservient to the general research programmes.

**Q404 Mr Key:** Would anyone else wish to add to that?

**Dr Cotton:** I think the emphasis on application is prominent. Let me say, around water and sanitation—which is a key area, it runs through the Millennium Development Goals—that there it is the application which needs looking at. And I think it is the application within a context: the dissemination and the uptake. There are a lot of ideas there, there is a lot of research there, but I think we do not have the exploration of what works well and what does not work well. Where is the evidence base within particular contexts? From that point of view, I would say that that focus in water and sanitation is correct. More broadly, I can think of areas where in technology terms it is the quantum leap stuff which has real application to development; for example, mobile telephony and global positioning. Now, in terms of locating rural water supplies, water sources right out in the bush, wherever you are, somebody can go there with this kit, click it in, and you can start to map your assets. The technology of the assets is simple and appropriate but you are then using a very high technology approach to do the asset registers, which is what is going to lead to then get good management of those assets. I think that is the exciting area: when you can look at the quantum leaps in technology which can apply straight to these situations.

**Q405 Mr Key:** And you are saying that DFID really is not very excited about these quantum leaps.

**Dr Cotton:** It is a question of whether they are looking to develop these quantum leaps themselves. I guess that is where John said there would be scope maybe for improving those links between that type of exciting new technology and its application.

**Mr Cameron:** If I may add to that, I think it is unfair to say really that DFID are not interested in the quantum leaps, that they are not interested in development technology. Clearly from the contacts we have there is a lot of enthusiasm for getting into a lot of very interesting research projects. I think that vital within that, as Andrew has just said, is to be able to have a very clear assessment and record and database of what works and what does not, so we can move forward all the time and discard those that have clearly failed.

**Professor O'Reilly:** First of all, I think the two other participants have put the case, in a sense, very well, but perhaps I could just pick up on how this might actually relate to EPSRC and EPSRC researchers. Some of the "quantum leap" kind of discussions are the sorts of things that EPSRC itself has funded. It has been research which has been undertaken here, which has been informed by opportunities in developing countries and looking at

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telecommunications for regional areas—how one can deploy that and so on—and the research that we do in telemedicine that would carry across and so on. But in terms of you saying, “But what about the really big development?” let me reiterate what I said at the beginning, Chairman: I do believe there is a very important role for EPSRC—and I think we are very open to it—in terms of providing really good training opportunities, such that the countries themselves are able to pick up and take on that thought for the future. That was really why in my opening remarks I said that I think one does have to look at what is the best fit in terms of the remit and the mission and those things which we are already well set up to do and do well, and getting good synergies in there. You will find those in the Masters programmes that we operate, where people come and so on. I think in the recent discussions with DFID that may well be an area for future development that I would be very keen to develop. I think the Dorothy Hodgkin scholarships are a superb initiative that fit in very well with that, and EPSRC is a strong contributor and indeed is administering this scheme. So I think these things play in different dimensions to the different facets.

**Q406 Mr Key:** Does the Research Assessment Exercise affect your attitude to doing research on international development?

**Professor O'Reilly:** That is presumably not a question to me as EPSRC.

**Dr Cotton:** Shall I take that one.

**Q407 Mr Key:** Yes, please.

**Dr Cotton:** It is difficult because we have to try to make a balance between producing the peer review journal outputs which are required for research assessment . . . . I should say that my institute has actually been in and out of the RAE: it has been in it, it has been out of it, and it is back in it again. From that point of view, we are interested. We are part of Loughborough University and therefore we desire to do the peer review publication to contribute to RAE as a key thing. It is actually difficult because our primary work and our bread and butter is much more on the development and the application. Also, we find that we have to have a balance of activity—it is not just research, it is capacity building, training and consultancy—and basically that gives us our competitive edge. That enables us then to make, if you like, the cutting-edge research applications, because we have worked in the field. In a sense, the proportion of our time that we spend is squeezed and it is not easy to allocate the time for RAE contributions.

**Q408 Chairman:** Do you think the RAE should be modified to allow for your ventures?

**Dr Cotton:** I certainly think it should.

**Professor O'Reilly:** If I may add a small thing, prompted by your discussion. There is a certain sense in some of what Andrew is saying that this is a different dimension on knowledge transfer as well, is it not? The question then would be how in our system do we give proper recognition and put it in

the right place in terms of that sort of dimension. Of course the old RAE was not designed for that. The new RAE or whatever informs the knowledge transfer funds could take account of these and I think that would be a very healthy thing to have considered.

**Q409 Mr Key:** A large chunk of our international development budget is channelled through the EU. What is your experience of applying for EU money in international development projects?

**Dr Cotton:** Our experience is difficult. We actually have a number of applications on the go at any one time, but it has certainly been difficult—and we have not been particularly successful at it, largely because we have not I think maybe focused at that source of funding, which is something that institutionally we are now doing much more strongly and putting more resources into doing.

**Q410 Dr Turner:** Does it involve the same sort of complexities as the framework development funds? Do you have to identify European partners in order to make your bids and so on?

**Dr Cotton:** Yes. Definitely it has those. It is around different sorts of partnership building. We have good partnerships with the south and we have partnerships with a number of European organisations, but we are looking to extend that.

**Q411 Mr McWalter:** We have heard that other European countries, when they finally do get some EU recognition for their work, then get correlative funding so that the project is viable, while, in the UK, the UK government is much less willing to provide that correlative funding and EU funding itself does not even fund the total level of overheads the projects incur. I cannot see why you would bother doing it in those circumstances because all you are going to end up with, even if you get the EU money, is a loss-leader. Should British government policy not change so as to make these projects more viable?

**Dr Cotton:** It would help if British government policy changed. Certainly, from where we sit, if we are making a serious EU application we have to look very carefully at that and we do have to treat it as something which does not recover our overheads, because we do have to recover our full overhead costs.

**Q412 Mr McWalter:** It is not the EU's fault, is it? It is DFID's fault, because if they took this seriously they would make the representations to the government that this needed to be done.

**Dr Cotton:** I think it is a problem that needs to be sorted out.

**Q413 Mr McWalter:** Why are you so pussyfooting on DFID? We ask you about numbers of engineers and you say there is a bit of a problem about numbers. Why do you not say straight out that there are not enough engineers?

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**Dr Cotton:** With respect, I suggested that you had a good look at it, and I said in here that maybe you should take one of your indicators to be that, so I do not think I have pussyfooted around it.

**Q414 Chairman:** The RCUK's written evidence suggests that "At country level DFID can also increase its engagement with the international development programmes of the International Agencies, the European Union and its European partners." How can that coordination be better achieved?

**Professor O'Reilly:** I think you have to look at the inhibitors, Chairman. To whom can we talk? I think there are very good ways in which we do that through other research councils in Europe and so on.

**Q415 Chairman:** Talk is cheap.

**Professor O'Reilly:** Exactly so. I think the biggest inhibitor does not apply just for the development; it is actually to do with EU funding of research. You have been touching on something that is not particularly a DFID problem—although there is the possibility of some amelioration of it. My personal view—and you know this because you have heard me say this, Chairman—is that it would be far more sensible if in Europe we actually cut to the quick and said, "Let's fund research from Europe properly so that people do not have to dance around all of these things." I think that applies to development, just like it applies everywhere else.

**Q416 Dr Turner:** DFID's change of research strategy wants to focus on four primary themes: agricultural productivity in Africa, killer diseases, states that work in the interests of the poor and climate change. First of all, what are your views on this strategy? Secondly, what do you think you as engineers have to contribute towards this?

**Mr Cameron:** Certainly, as I said earlier, as important as all those four areas are, I think there is an underlying problem that the engineering aspects are tending to be demoted. Underpinning all of those things, as we said in our paper, are the infrastructure elements and none of those aspects of research can stand alone without adequate water, sanitation, access, communication, energy, buildings and so on. If we forget about those and think that we can solve all of the poverty issues without those, we are going to be very much mistaken.

**Dr Turner:** I do not disagree with that.

**Q417 Mr McWalter:** To put it colloquially, you are saying they are plonkers, are you not?

**Mr Cameron:** I am not saying that, I am saying that the new strategy paper is not giving sufficient significance to the engineering that underlies all those aspects of development that need to be studied properly and much more so.

**Q418 Dr Turner:** You co-hosted the applied technologies workshop during the DFID consultation for the research strategy. What are

your views on the way DFID conducted that consultation? Was it an adequate process? In fact your earlier remarks imply that perhaps it was not, because the importance of the infrastructure policies does not seem to have come through in the strategy.

**Mr Cameron:** I would not say necessarily it was the fault of DFID or people who have helped develop those workshops. It may well be our fault for not being sufficiently trustful in driving the fact that the infrastructure has to underpin all of those aspects. I think we were frustrated that, possibly due to lack of eloquence on our side/a high level of eloquence on the other side, the aspect, important as it is, of the topic of agriculture did seem to take prevalence over everything else.

**Q419 Dr Turner:** DFID's new strategy shows a commitment on DFID's part to public/private partnerships. You have expressed a certain amount of scepticism regarding their benefits as far as developing countries are concerned. What is your evidence, your judgment, of the possible role of PPPs in developing countries?

**Mr Cameron:** The evidence is hearsay. There are clearly some good examples of private partnerships but they depend totally on which organisation is promoting them. How strong is that organisation? How strong is the contract prepared for the private partnership? To what extent is that partnership developing and underpinned by the desire for corporate social responsibility? If the contract is purely written on a profit gain basis for the private investor, it is going to fail—and it will fail because it is likely to disenfranchise the poorer part of the poor people who cannot afford the new taxes and tariffs that are imposed. So we have concern in that way. To some extent we have seen overseas some possibly corrupt organisations promoting private partnership as the way out of the problem, but, unless the contract is written by someone separate to that, you are likely just to make the situation worse.

**Q420 Dr Turner:** Yes, that is almost generic as far as PPPs are concerned, is it not?

**Mr Cameron:** Yes.

**Q421 Dr Turner:** Perhaps partnerships with NGOs might be more appropriate in developing countries.

**Mr Cameron:** I think that is so and I think it needs to be partnerships with the professional bodies in those countries who have a great interest in developing in-country capacity.<sup>6</sup>

**Q422 Dr Turner:** Before we leave the subject of the strategy, could I ask the rest of the panel what they think.

**Dr Cotton:** The one area that comes out is climate change. I think there is definite scope in there. I also agree with Peter's remarks that a concern in the

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<sup>6</sup> *Note by the witness:* Indeed, as well as the excellent links ICE has with many NGOs, it has assisted the Institution of Engineers Bangladesh to move towards becoming a qualifying professional body, and has Agreements of Co-operation with sister professional institutions around the world.

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other areas is that some of the infrastructure issues which are actually underpinning the developments may get lost. That is not saying that it should be frontline technology or engineering research but that it should be part of the considerations. That would be my concern, that it comes into the equation.

**Q423 Dr Turner:** Clearly climate change has to be a significant one, because if developing countries are industrialised on the basis of fossil fuels there is no hope for any of us. What is your view of the effectiveness of programmes such as REED and DFID's involvement in those?

**Mr Cameron:** I am sorry?

**Q424 Dr Turner:** Renewable Energy Emerging in Developing countries. The Government is involved in this. It is an international development which brings micro-generation to village houses and this kind of stuff.

**Mr Cameron:** I know very little of that. I know that some of our bigger energy companies are investing money in decentralisation of electricity generation and beginning to show some substantial potential gains for providing energy to rural areas. I think that is terrific and needs to be encouraged. It needs to be brought back into the DFID programme to see how that can interrelate properly with other work that is going on.

**Q425 Dr Turner:** It does seem to be one of the most important avenues of addressing the climate change issue.

**Mr Cameron:** Yes.

**Q426 Mr McWalter:** Andrew you nearly said in evidence that the commitment of DFID to training and capacity building in engineering and technology has reduced over 20 years. I said "nearly said" because you put a "seems" in there to slightly dodge the issue, but I take it you really meant that you thought it had reduced. What is the evidence for that?

**Dr Cotton:** The evidence is primarily from our own Masters programme which has been running since 1980. I think the Committee has heard before about the change in the funding that went through, so that was one aspect of that. The argument is: We should not be doing it here, so do it in-country or, even better, do south-to-south transfers on some of this work. I think the danger in that is that you can end up with good project-specific training programmes in relation to individual projects and programmes that are going on. I think you lose from that the more generic aspects of it. How do you take it up one level? What happens when you move away from a particular project in terms of its implementation? I would start from the next generation of engineers. I think that is actually where you will start to see outcomes in terms of reducing poverty. One can see why it went to be more focused in terms of project-based training, but I think in doing so it lost out on some of the longer-term benefits. For example, the Dutch government still, I understand, have a more

substantial system of scholarship funding, which has been going on for many, many years and they have stuck with that, through major institutes there like the Institute of Hydraulic Engineering in Delft.

**Q427 Mr McWalter:** You indicated in your evidence that it is your own institution which say, "Is anybody looking at the overall picture?" and highlighting some data. If DFID are funding MSCs, how many did it used to be and how many is it now? How many of those come from overseas? Are those data available and, if they are available, why was that not part of your evidence? If they are not available, do you not think something should be done so we do have an effective monitoring of this position?

**Dr Cotton:** I think it would be important to have an effective monitoring of the position.

**Q428 Mr McWalter:** So those data are not available.

**Dr Cotton:** I can provide data from my own institution on that. I can provide a breakdown historically.

**Q429 Mr McWalter:** This is a pretty sorry story really but what is the reason for it? Peter made the point just now that maybe we ourselves have not been sufficiently pushy about the role of engineering and improvement of infrastructure and so on. Is the reason partly that you have not been pushy enough? Is it partly that the engineering profession itself is desperately fragmented, so there is never a voice for engineering, there are always 20 voices seemingly saying different things? Or is it that there has been a history of government neglect since 1980 which is carrying on really, at least in this regard.

**Dr Cotton:** I think you make two important points there, and I agree—I mean, as a chartered engineer myself—that engineers are not pushy enough. They are often, if you will forgive the expression, too gentlemanly about these things.

**Q430 Mr McWalter:** One can see it in these documents: "One could say . . ." rather than just something as it is.

**Dr Cotton:** I regret that is probably the sort of academic tendency that always allows for the possibility of something.

**Q431 Chairman:** You are just shrinking violets.

**Dr Cotton:** I actually think we have not been pushy enough. One of the reasons, again as you said, Peter, in terms of the consultation, is we are not upfront enough. We are not blunt enough and I guess we do not access the right people.

**Q432 Mr McWalter:** On your left is the voice of engineering. Could he not be blunt enough?

**Professor O'Reilly:** Thank you for gracing me with that, but I think the Royal Academy of Engineering and various engineering institutions might feel they had a voice as well, of course.



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**Q433 Mr McWalter:** We cannot get a peep out of the Royal Academy at the moment. Does that surprise you? We are doing our best to try to get them to come off the shelf. John, you are a bit of a Council expert.

**Professor O'Reilly:** Ex-member.

**Q434 Mr McWalter:** Ex-member. Can you not get them to take a bit of an interest in these matters?

**Professor O'Reilly:** I will take that away.

**Q435 Chairman:** Could I bring this part to a halt now by asking a last question on the word "sustainable". The Millennium Development Goals focus predominantly on issues such as alleviation of poverty and hunger, primary education and maternal and infant health, all of which we would want to do something about and which something should be done about, but that does not really augur well for a longer, sustainable improvement programme, does it? It sounds like a short-term political whim and that is it. What do you think?

**Mr Cameron:** I think there is a responsibility on engineers to make sure that whatever programmes we implement are sustainable. As an example, we have seen recently that there are some roads in Cambodia (I believe) that have been reconstructed (about five years ago) and now we are reconstructing them again. We have to make quite sure that the contracts providing that sort of infrastructure clearly underline the need for sustainable development. It is in part also related to capacity building, inasmuch as we should make sure that any infrastructure provision that is being made should involve the indigenous population<sup>7</sup> to help construct it so they understand it, so they learn about it, so they can then maintain it and then it becomes sustainable.

**Q436 Chairman:** So the answer is yes, it is too short term.

**Mr Cameron:** It has been but I think that is beginning to be recognised and changed.

**Q437 Chairman:** Who by?

**Mr Cameron:** I think by the professional institutions.

**Q438 Dr Turner:** Could I go back to this question of climate change. I mentioned the REED programme and I have just remembered that the REED

programme was actually initiated by the Foreign Office and not by DFID at all, which you might think slightly strange. I do not think DFID had very much involvement with it. It is very curious that they should not, and very curious that it should not have come to your attention during that consultation process. There seems to be a certain lack of connectivity going on between government departments here.

**Mr Cameron:** I understand that DFID have now organised or have been running for a little while—and I cannot remember the exact title of it—a sort of information sharing website which it is hoped will be shared by government departments.

**Q439 Chairman:** How many hits does it get a week?

**Professor O'Reilly:** I do not know.

**Q440 Chairman:** One, I would imagine. Andrew, do you want to comment on sustainability?

**Dr Cotton:** Sustainability of the MDGs, if you are looking in terms of the timeframe of it, no. If you are looking in terms of moving in that general direction, I think then the role of the engineer and the role of technology, the responsibility of that, is to ensure that the systems we put in—and again this can be very, very simple in water supply terms—are sustainable systems. Operation and maintenance, for example, and financing of operation and maintenance, can be dealt with locally.

**Q441 Chairman:** John, would you like to go on the record on this?

**Professor O'Reilly:** Yes, I would. Just picking up on what has been said, I think it is important that there is a continuum in terms of this sustainability. So what has been said about maintenance, and also driving up the professional confidence and so on, and at the very top end of that for the longer term. That is where the comments I made at the beginning are particularly relevant, which is making sure that there are ways in which people can develop in countries, can be trained to the highest level, such that there is a long-term sustainability issue. That is where I said coupling with, for example the Master programmes and so on and scholarships for that is a positive development in that direction.

**Chairman:** Could I thank you very much indeed on behalf of the Committee for helping us with our inquiry. You have added some interesting dimensions to it. Thank you very much indeed.

*Witnesses:* **Professor Andy Haines**, London School of Hygiene and Tropical Medicine, **Professor Ian Maudlin**, Centre for Tropical Veterinary Medicine, and **Mr Nick Winterton**, Medical Research Council, examined.

**Q442 Chairman:** Could I welcome you to the second half of our sessions today. We now move into the health arena and I am sure you are well versed in what the inquiry is looking into and what its intentions are. DFID is central to what we are investigating. They have made some significant changes recently and I wondered if you had anything

to say about these changes, if you had noticed even, and if you think they are significant or insignificant in terms of their approaches to these problems.

**Professor Haines:** We have looked at the research strategy and we think there is a lot in it that is commendable. I should say that I think health has had a very central role in DFID in the past. There has been a very strong record of health research directed at problems of development and we were

<sup>7</sup> Note by the witness: and professionals.

concerned that that fruitful relationship continued with the academic sector. I think the research strategy, although it has taken a little time to come out, contains many good elements to it. There are a couple of issues which perhaps need more development. One is the issue of capacity strengthening in low income countries, to which certainly there is some commitment in this strategy, but I think we need to know how that is going to be undertaken. One of the problems is of course that there are very few incentives for UK-based institutions to undertake that kind of capacity building. It does not figure in the RAE; we cannot afford to send staff to spend large times in low-income country institutions so the question is how we can in practical terms strengthen the incentive system to build up research capacity in low-income countries. The other issue which needs to be dealt with head on is the impact of untying aid. Many institutions were used to competing on the international field. We have no problems with that, but it is of some concern to what extent that is a level playing field. For example, if UK institutions have to put in bids based on full economic costings, whereas institutions, say, from North America do not have to do that, then there is a concern that there might be some kind of undercutting or disadvantage to UK institutions and I think that needs to be thought through in more detail.

**Q443 Chairman:** Tell me about the biggest research problems you see in the next few years in the field of international development. What are the disease problems?

**Professor Haines:** The disease problems are obviously HIV/AIDS, which is a major killer: over 40 million people infected. There is a lot of work going on on AIDS vaccines. We are some way I think from any kind of vaccine that is useable. There is also a lot of work going on on microbicides, to try to prevent transmission. Again, there has been no real proven effectiveness as yet, but there are some very important trials going on. The main struggle at the moment with HIV/AIDS is to improve the update of proven effective preventive interventions, like condoms, for example, and also to implement anti-retroviral treatment in very large populations. No one has ever tried to do that before. The WHO programme, the Three by Five Programme (aiming to get three million people on ARVs by 2005) is an attempt to do that.

**Q444 Chairman:** Run me through some of the other things as well.

**Professor Haines:** The others obviously include malaria and TB. For malaria, again, there is some work around vaccines but not so far very fruitful. It hopefully will be in the future. There have been concerns about anti-malarial drugs because very few have been developed in recent years. There are one or two recently being developed and we need to get more in the pipeline. TB is an important area, particularly in terms of multi-drug resistant TB and the problems of trying to get people to adhere to the treatment over fairly long periods of time.

**Q445 Chairman:** What about animal human interactions? SARS, as you know, scared the pants off everybody suddenly. The fear is that this is now going to be much more of a feature of health problems, not only in the developing world but in the developed world as well.

**Professor Haines:** That is right. It is more than a development issue, although it can have big impacts on the economy of China and other countries where SARS may arise. But it is certainly a global issue and there is a question whether we properly configured to deal with rapidly developing global epidemics. I think the WHO again has done some good work in this, setting up a global observing system to detect very early new epidemics, but we certainly need more research.

**Q446 Chairman:** Where would you rate DFID in this great perspective?

**Professor Haines:** I think DFID has made some very useful contributions in the past, particularly because it funds work in the area of health systems. Health systems is a very important area of research because many of the constraints that we are coming up to now, in terms of, say, delivering anti-retrovirals, are the fact that health systems are not functioning in many countries. We need to invest money into whole systems research. How can we develop sustainable financing systems, sustainable human resource development systems, mechanisms for ensuring quality of care? DFID is one of the very few funders of this kind of applied research, which is very important, just as basic research is important. We need a whole spectrum of research.

**Q447 Chairman:** Ian Maudlin, can you add to that? Nick Winterton from the MRC, where do you fit into all this stuff?

**Professor Maudlin:** In the area of animal health, of course, DFID is one of the most important funders of tropical animal health research—if not **the** most important—certainly in the UK. It is very difficult to get money for animal health research in the tropics. Research in this country is mainly restricted to things like foot and mouth disease which of course are very important to us. The Institute of Animal Health deals with problems like that, but to get money for other sorts of research which does not directly impact on DEFRA is far more difficult and we are reliant very much on DFID and the Wellcome Trust for that sort of funding.

**Q448 Chairman:** MRC, where do you fit into all this?

**Mr Winterton:** Would it be helpful if I said a little bit about what the MRC does in terms of funding research overseas and in relation to the needs of developing countries?

**Q449 Chairman:** Yes.

**Mr Winterton:** We spend about £40 million per annum on research relevant to the developing world. A very large proportion of that is research in the field of infections. In relation to more applied research, of interest particularly to DFID, the figure is about £23 million, and I think that reflects very much the kind

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of priorities that Andy has described. If you look at where the bulk of that money is being spent, it essentially is on HIV/AIDS; it is on malaria, it is on TB; there is quite a bit on maternal and child health—so an interest in child mortality and, relevant to that, quite a lot of support for vaccine trials in the developing world. As you probably know, we fund two quite large units in Africa, one in the Gambia and one in Uganda: the Ugandan one focusing very much on HIV/AIDS; the Gambian with a broader remit in the general area of infections of importance in the developing world. So, if you like, our own investment—and that is a pattern that has been established for a good many years now—I think does reflect those priority needs. DFID makes and has made historically a significant contribution, currently of the order of £4 million, to the MRC's work and portfolio of research in the developing world.

**Mr Key:** What are your views on what DFID is doing in allocating money to other research funding bodies, for example, giving £4 million to the MRC; £20 million to the Consultative Group on International Agricultural Research; £14 million to the International AIDS Vaccine Initiative? Is DFID getting value for money from the various investments or would the money be better spent by directly funding research elsewhere?

**Q450 Chairman:** That is individual researchers, rather than giving it to bodies.

**Mr Winterton:** In relation to the MRC, essentially of course that is money that is then fed through to individual researchers. The process is that the MRC makes the decisions in relation to the research that is funded. There was a review conducted by the Swiss Tropical Institute of how successful the MRC's concordat with DFID was. I think the conclusion of that—and this is before we negotiated the renewal of the contract—was that it represented very good value for money as far as DFID was concerned. It was a cost-effective mechanism for delivering research of very direct relevance to DFID's agenda.

**Q451 Mr Key:** Each of you, do you apply to DFID for research grants or do they approach you and say, "Please could you do some work for us"?

**Professor Haines:** It is a mixture of both really. In terms of the Knowledge Programmes, they have been strategic programmes. These are the 15 programmes that DFID has funded over the years on a range of health issues. The school houses seven of those programmes and they are largely driven by DFID's perceived needs but obviously our researchers play an important role in deciding what the detailed research questions might be within those broad strategic projects. You also asked earlier on about the investment of DFID into these international initiatives. I would say that I think it is very important for the UK to be at the table in some of these very big international initiatives around AIDS vaccines and so on. Certainly the amount of money we are putting in is a relatively small proportion of the total but it does give the UK a seat at the table to see how these important initiatives are

developing. The general point I would make is that I think the proposed modest increases in health research may not reflect the requirement, given the overall uplift in DFID funding. I would like to see obviously a greater investment in health research, given the importance of the problems.

**Q452 Mr Key:** What is your own experience of dealing with the European Union when it comes to getting money for research?

**Professor Haines:** Like earlier respondents, we have had quite difficult experiences with the EU. It is quite bureaucratic. Setting up the networks is quite time-consuming. A point that came out earlier on was the fact that the UK Government does not provide any incentive, so that there can be a negative impact on the institution from taking on the coordination function for a large and complex grant (particularly when you are actually responsible for many of the partner institutions who may or may not actually keep appropriate financial records and so therefore it is a major responsibility to take on). I feel that if the UK Government wants us to be big players in the EU, they need to create a more supportive funding structure—as some other European countries actually have. There is a new development in the EU, the European and Developing Country Clinical Trials Platform, which I think is worthy of noting. I think it is quite an important development. It does have the potential to put more direct funding into low income countries, in collaboration with northern partners, actually to test out some of the potentially effective interventions. That is a development to be welcomed.

**Q453 Mr Key:** Could I probe a little bit further on the process and mechanism of getting money out of Europe. Do you think the deficiency lies in the fact that the Government does not have somebody sitting out there in Brussels to guide you as an applicant through the processes, or is it DFID who have neglected this and have not encouraged you and others in this particular area of development?

**Professor Haines:** I do not think it is a particular problem of DFID, I think it is a general problem of EU funding. We do have the UK Research Office in Brussels which does give guidance about how to apply. So I do not think you can say there is a lack of guidance. I think it is more a question of policy: Does the UK Government want to encourage the UK to be major players in European research or not? The UK in general has been pretty good at getting EU funding, but it comes with a price.

**Q454 Mr McWalter:** You have said two things which give me cause for concern. You have pointed out there is a need for a policy change really in relation to those EU funded projects. The second thing you said way back was that you were concerned about policy changes within DFID that mean you may well be contracting for work which actually is taken away from you because of the rules, because of DFID's change of policy in effectively having a free-for-all about tenders. You correctly pointed out the United States tenderer might have

some level of subsidy for their infrastructural costs or whatever but we might not have and we might hence lose it. The combination of those two things might suggest we end up in a situation where we lack the capacity to support other people's capacity building. Would you agree?

**Professor Haines:** That is a theoretical possibility. I have enough faith in the UK Government and DFID to hope that that will not happen, but I think it needs to be very carefully considered and mechanisms put in place to guard against that. Certainly there has been rather a tendency in DFID not to see the support of UK capacity as a core part of its mission—and one can understand its mission is international development. However, I think it is very important to say that the UK does have major capacity—it is not necessarily very large but I think it is high quality capacity, certainly in health research and no doubt in other fields as well—and I believe that if the UK wants to play a major role in international development, which it patently does, then it is very important to maintain and strengthen and develop that capacity in health research because it is very much looked up to around the world.

**Q455 Mr McWalter:** You would like our report to emphasise that fact.

**Professor Haines:** I think it would be a very important point to emphasise.

**Q456 Dr Iddon:** Could I direct some questions to the MRC, please. How does the MRC balance its research finances between diseases that predominantly affect the developing countries against those that predominantly affect the developed countries?

**Mr Winterton:** Not an easy question to answer. There is a mix. Part of it is essentially a response to scientific opportunity. In a sense, part of MRC's investment will reflect what kind of proposals are coming forward, the quality of those proposals, and therefore it will reflect in part the research interests of the UK research community. The balance, as it were, between work that is directly relevant to the developing world and work that is, as it were, only really of direct relevance to the developed world, that balance will change over time in part as a reflection of that. Then there is, if you like, an overlay on that, which is that the MRC has made a conscious decision that we have a responsibility to make a contribution to the health needs of the developing world, hence the decision to maintain really quite significant investments overseas ourselves in the Gambia and Uganda. Therefore, that, if you like, is a strategic decision that there must be a certain minimum level of investment that we need to make in part to retain infrastructure overseas to enable us to play our own part to a degree in capacity building overseas. So I would say that the total sum is a mix of that strategic decision and, in a sense and in part, our responsiveness to the research community in the UK. But I think, probably fairly consistently, about 5% of our budget is being spent on work that, if you like, is almost exclusively of relevance to the developing world and

probably about 10% of our budget is broadly supportive of that, and that has not changed historically very much.

**Q457 Dr Iddon:** Do you think £4 million is a significant contribution by DFID in the concordat that you have developed out of a total of £23 million?

**Mr Winterton:** We would obviously welcome more. It is particularly important in two respects. One is that it enables us, and quite explicitly, to support health services research overseas which we would not see normally as part of the MRC's mission. This money enables us to broaden that. Obviously it is also a very important part of sustaining that decision, that strategic decision, to maintain a certain level of investment in relation to infrastructure and capacity building. It is more than symbolic—that is important—but also it does make a significant contribution to that. We obviously could spend more, there is no question about it. There are more good research opportunities out there that we are not exploiting, and we obviously could spend more money, both from MRC's own resources and if we had more money from DFID.

**Q458 Dr Iddon:** The UK overseas aid budget is increasing. We would like to get 0.7% of GDP obviously. Do you think some of the money you spend on your work overseas should come from the aid budget?

**Mr Winterton:** Yes, I think there is a very good argument for that. Clearly part of it is essentially aid, there is no question, and no one can argue that that is a very major issue in relation to playing our part in tackling poverty, particularly in sub-Saharan Africa. There are real improvements that can be made in health terms and that will have huge spin-off in terms of poverty.

**Q459 Dr Iddon:** Are you aware that any of the UK aid money does go in the direction of disease? If not, have there been any discussions, with the increase in the aid budget for the future, hopefully, in putting some of that money into disease?

**Mr Winterton:** Within DFID, of course, the spend in relation to health is very substantially more than the money that is channelled through the MRC. On the Knowledge Programmes to which Andy referred, the spend is of the order of £11 million or £12 million a year. And we do play our part in some of those programmes as well. For example, in the Virucide Project the MRC is very active. Our units play a part in participating in managing some of these other programmes.

**Q460 Dr Iddon:** We did refer to your concordat with DFID in the previous session. Could you tell us what the benefits and problems are of developing that concordat and how it may direct itself in the future?

**Mr Winterton:** Yes. We have had a long and really quite productive association with DFID and its predecessors. The Ministry of Overseas Development back in the 1960s was contributing probably a comparable kind of sum to the MRC's

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budget as DFID is today, so there has always been a relationship where clearly DFID and its predecessors wanted to know what they were getting for their money, for making their contribution. We were anxious to be seen to be responding to a key stakeholder in this field, so, if you like, the concordat has enshrined that in a formal statement of what we are trying to achieve, and how DFID will influence MRC decision-making, which is a key part of it, and how we will monitor progress. It is an informal encouragement to closer working, to regular meetings between officials and a regular annual review of progress. It has an importance in terms of, as I say, enshrining good working relationships within an agreement.

**Q461 Dr Iddon:** Does it add value to the work you are doing, or is it just a monitoring exercise?

**Mr Winterton:** In itself it adds value, in the sense that it sets out procedures whereby DFID can play a formal part in helping to shape the MRC's programme. In that sense it adds value, but it is not in itself a value-added document.

**Q462 Dr Iddon:** Does it cause problems for you?

**Mr Winterton:** No, I do not think in itself it causes any problems at all.

**Q463 Chairman:** Professor Maudlin and Professor Haines, who do you think should fund the tropical animal health work in the UK institutions?

**Professor Maudlin:** As I said before, it is at present funded largely by DFID and the Wellcome Trust.

**Q464 Chairman:** But not enough.

**Professor Maudlin:** The Animal Health Programme of DFID is one of the National Resources programmes of DFID and it gets about £1.5 million a year. We had a meeting recently at the Wellcome Trust where they said, "That is about the size of one of our project grants." They perceived it as being miniscule.

**Q465 Chairman:** It is.

**Professor Maudlin:** Yes.

**Q466 Chairman:** Absolutely miniscule.

**Professor Maudlin:** Yes. Because, you see, the problems with animal health—notwithstanding my colleagues' interest in AIDS—are of a similar magnitude. Pig rearing in Africa is now a major money earner but African swine fever is a major problem. The virus which causes it is as complicated as the AIDS virus, so throwing a £100,000 grant at this problem is speculative, to say the least.

**Q467 Chairman:** If you are unhappy, how much should they have? I should say I just reviewed a grant for somebody on public understanding of science and they got £0.25 million for it. £0.25 million—so that is not far off the £1.5 million—and you can balance up what is more important to the world.

**Professor Maudlin:** Yes, and we are supposed to handle all the tropical animal health problems with that £1.5 million, including dissemination, including . . . .

**Q468 Chairman:** Come on! Here is your chance. What do you think you need to handle the problems?

**Professor Maudlin:** In fact DFID have acknowledged the fact that this is an under-funded area. As they say in their new research framework, they intend to set up a public/private partnership to help with this which will have much more substantial funding.

**Q469 Chairman:** You will forgive us if we are a bit suspicious that that only came out after our inquiry started. You cannot possibly say anything.

**Professor Maudlin:** I am not aware of that.

**Q470 Chairman:** You know why we are suspicious of this. What do you think we need, to do the project work that is so essential?

**Professor Maudlin:** Something of the order of £10 million a year.

**Q471 Chairman:** Andy Haines?

**Professor Haines:** This is really not my field of expertise, but certainly it does sound as though it is very much under-funded.

**Q472 Dr Iddon:** Where do you think would be appropriate for that money to come from? From the Research Councils? From the EU?

**Professor Maudlin:** The EU is a bit of a non-starter, and I speak personally here.

**Q473 Dr Iddon:** You mean you have the scars to prove it.

**Professor Maudlin:** Yes. Battle scarred. I would not again subject myself to applying for money from them.

**Q474 Chairman:** We will protect you.

**Professor Maudlin:** One would say stitch-up is their way of working.

**Q475 Dr Iddon:** You would look to Research Councils?

**Professor Maudlin:** Yes, DFID, where there is a level playing field; or the Wellcome Trust, where there is a very level playing field.

**Q476 Chairman:** So what has this new research strategy come down to? Does it really, really address the problems?

**Professor Maudlin:** I think DFID say in their preamble that they are going to focus on four big research themes, which is right: agricultural productivity in Africa—which is what I am really concerned with mainly; killer diseases; climate change . . . These are the issues of the day, are they not, and it is quite right that they should focus their efforts on those.

**Q477 Mr McWalter:** I do not know how much you heard of our previous evidence session but there is an absolute gap in terms of things like actually providing resources for water and sanitation and yet that is an absolutely fundamental primary health concern, is it not? You are all asking for extra money but there is a whole area of activity that is vital for health that nothing much has been done about at all. Do you not think that you, wearing your health hats, should be concerned to try and get the engineers to be doing the stuff that needs to be done to improve the health of people in developing countries as well?

**Professor Haines:** Certainly water and sanitation have been rather neglected and certain colleagues at the London School who do specialise in this area keep on telling me that not enough money is going into research and development in this area, and also into research on relatively simple interventions like promoting hygiene within low income households, which can have a very major impact on important diseases like diarrhoeal diseases and so on. These have been relatively neglected and I suspect that you are right: probably the return on research and investment in that area would be high.

**Professor Maudlin:** I think there is an enlightened self-interest argument for a lot of our work as well. In terms of animal health, as you know, these viruses spring up from nowhere and bite you and mostly they come from animal reservoirs. We have an interest of our own therefore in monitoring these things. In order to do that we need scientists who understand them. They do not produce them overnight. It takes 20 years.

**Q478 Chairman:** Do you know about the water hyacinth problem in Malawi?

**Professor Maudlin:** I know about the water hyacinth problem in Lake Victoria very well.

**Q479 Chairman:** Tell me what the mistake was there. What went wrong in that whole process?

**Professor Maudlin:** The mistake in the first place was allowing the water hyacinth to get into Lake Victoria but there is nothing we can do about that. They did introduce what they thought were some hi-tech solutions to the problem which made it worse. One of the interesting side effects of that was—

**Q480 Chairman:** Who was responsible for that?

**Professor Maudlin:** There were governance problems. Whose problem was it? Was it a Ugandan problem? Was it a Kenyan problem? Then, of course, they would each have different solutions to the problem although they were using a common source. Then there was a lot of competition and bidding for who was going to solve the problem. It turned out to be solved very effectively in the end by an introduced beetle which dealt with it. In fact it was a cheap solution which worked in the end. The big machines which were introduced to munch it up just caused a problem with snakes for the people who were involved with it.

**Chairman:** I must meet you outside this place!

**Q481 Dr Turner:** My colleague has already referred to DFID's new research strategy. What are your views on the choice of four central themes? Do you think they are the right themes—agricultural productivity in Africa, diseases, states working in the interests of the poor and climate change? Are these the right priorities? More importantly, do you think that the research strategy is going to approach those priorities in the right way?

**Professor Maudlin:** First of all I would ask, what are we doing here? We are talking about British research, and then we have to ask ourselves what can British research contribute that other countries cannot? As I said in my submission, there are five areas where we are better than the rest of the world. These are pharmacology, agriculture, veterinary science, pure maths, mineral and mining engineering. All the rest of them the Americans do better than we do, much better in fact. We have to ask ourselves are we going to be just generally throwing small amounts of money into a pond and having no effect or are we going to play to our strengths? I suggest we do the latter and add something significant to the international research effort rather than blundering about in the dark putting in a little bit of money here, a little bit of money there. We should focus.

**Professor Haines:** From the health perspective I think that many of the topics are along the right lines. I would say that the UK is also very strong in a range of health research areas, including clinical trials, for example, including in low income countries. In health systems research I would say we are very strong, and if you look at the US there is not the same reputation, if I can say that, for health systems researchers in North America. We are very strong in epidemiology. In communicable disease epidemiology, for example, there have been very important contributions from UK researchers. I would say that there are a number of important areas in which UK research is certainly amongst the best in the world and is very widely respected. Some of the details need fleshing out. I come back again to the issue of capacity building as an important area because if we want to ensure that there is an indigenous research capacity in the next 20 years then investment will have to be long term. Some of these institutions in low income countries are barely functioning at all and they have been starved of resources for many years. Some international agencies have taken a much longer term view than DFID in terms of research capacity strengthening and if we want to create an autonomous research capacity in low income countries that is one of the things that needs to be addressed in the research strategy. Many UK institutions are prepared and committed to help but at the moment, as I said previously, there is very little incentive for us to do that, both in terms of the research assessment exercise and in terms of our own research programme. I would hope that we can integrate within some of these important research areas a strong capacity building component.

**Q482 Dr Turner:** Your memorandum called for a UK policy research forum involving both government and non-governmental members to

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conduct a dialogue about research efforts and obviously promote co-ordination of those efforts. Do you think that the proposed Funders' Forum announced in DFID's research strategy could fulfil that function? Do you know whether DFID intends to ensure that developing countries' views are adequately represented in that forum?

**Professor Haines:** I do not know precisely what they have in mind but as I understand it the Funders' Forum that they are proposing could cover many of the functions that we have proposed in our submission so we were quite glad to see that specifically referred to. Certainly there is a need to draw together expertise and strategic insights across the UK in terms of research funding. On a global scale WHO clearly has an important role in terms of co-ordinating health research and one which, as a member of the WHO's Advisory Committee on Health Research, I hope to see strengthened in the coming years. There is a need for global co-ordination around health research but also, because the UK is such an important player in development research, this UK Funders' Forum seems to me to have some of the essential characteristics of the body we propose.

**Q483 Dr Turner:** Have any of you been invited to join?

**Mr Winterton:** There is a specifically health related Funders' Forum being formed between the Wellcome Trust, the MRC and DFID focusing on health issues to try and ensure improved co-ordination in relation to UK research funders, so that is, if you like, already being launched at the moment and we are actively involved in getting that off the ground.

**Q484 Dr Turner:** Professor Maudlin, your memorandum seems quite positive about the virtues of PPP arrangements. You may have heard in the previous evidence session that there were somewhat different views from engineers on that. Do you think that DFID is well placed to judge when a PPP is in the interests of the people in developing countries? What advice has DFID sought from you on this? Do you think they have enough commercial nous, if you like, to be able to make them work properly anyway?

**Professor Maudlin:** DFID have consulted with me about wanting to set up a PPP for animal vaccines. They have trawled the knowledge base now quite widely for advice both with professional consultants interested and experienced in setting up PPPs and with the private sector. The private sector in animal health is very small so it is very easy to get advice from them. There are about five big players. Of course, consultations with the developing world are the next important step. This is in its infancy, of course. It has not been set up yet. My enthusiasm for it stems from the fact that it should provide a boost to the funding given to the overall problems of animal health in the tropics which, I have to say, are mainly in Africa. Again, we come back to the problem of Africa and sustainability. The animal health research institutes in Africa which exist are

basically falling apart at the seams because of lack of funding. Ondesdepoort in South Africa, which is a very high level institution, is haemorrhaging staff.

**Q485 Chairman:** Which ones are falling apart?

**Professor Maudlin:** Ondesdepoort in South Africa, which was a major institution, is haemorrhaging staff, for obvious political reasons.

**Q486 Chairman:** There are others?

**Professor Maudlin:** Yes. The ITC (International tolerance Centre) in The Gambia is struggling because of lack of funding.

**Q487 Mr McWalter:** We have had evidence from Professor David Bradley from the London School of Hygiene and Tropical Medicine who says "... there is a need for the UK to fully accept responsibility for maintaining its own expertise and so its ability to help effectively". I do not quite know what you think the expertise is, Professor Maudlin, but do you agree with that?

**Professor Maudlin:** Yes. I think I said earlier that it is in our own interests to do that in the sphere of animal health. We would be foolish not to.

**Q488 Mr McWalter:** But you have only laid out five areas that we are any good at and let the Americans do the rest.

**Professor Maudlin:** I was quoting from an article in *Nature*.

**Q489 Mr McWalter:** It is much easier, is it not, to keep the expertise in a very small number of areas than to keep the expertise for dealing with the problem in the round?

**Professor Maudlin:** Yes.

**Q490 Mr McWalter:** Whose responsibility is it to maintain the UK capacity for research in international development?

**Professor Maudlin:** It is the responsibility of those with the money.

**Q491 Mr McWalter:** So about 50 players, all of whom have five bits of tiny pots who will not be able—you are spending your whole life trying to get the money and you never actually get to deal with the problems? Is that right?

**Professor Maudlin:** I would not put it as dismally as that.

**Q492 Mr McWalter:** It is very cosy sitting round in meetings rather than going out and trying to solve the problems, is it not? Is that how people end up?

**Professor Haines:** I would like to see DFID taking more responsibility for this area.

**Q493 Mr McWalter:** Thank you. That is what I was after.

**Professor Haines:** If we do not have a robust and resilient research infrastructure in the UK that will support development research then inevitably our policies will suffer as a result. Just to buy in consultants in the very short term to advise you on

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a specific issue is not the answer. You need long term strategic relationships with people who understand research and how to use research findings. There needs to be a receptor capacity at DFID level and we need to have long term strategic engagement.

**Q494 Mr McWalter:** So whenever we need co-ordination DFID goes missing; is that right?

**Professor Haines:** I would like to see stronger co-ordination. I also think that the Funders' Forum that Nick referred to could play an important role in this.

**Chairman:** Why do we not just have an Overseas Development Research Council where the political situation is addressed in a serious way rather than providing it in a very unco-ordinated way? Would that not be a very simplistic answer? You put the money in, people bid, you have a strategy, you have a programme. It happens in another arena.

**Mr McWalter:** And they work with MRC and all the other agencies to co-ordinate engineering and medicine together?

**Q495 Chairman:** And we put it in the London School of Tropical Hygiene and Medicine on the top floor in a broom cupboard.

**Professor Maudlin:** I think they would be delighted.

**Q496 Chairman:** What do you think, Ian Maudlin? Too radical for Great Britain?

**Professor Maudlin:** It is a good idea. I think some co-ordination of the overall effort is necessary.

**Q497 Chairman:** Is this the only way to get it, do you think, or will we be here in 10 years' time?

**Professor Maudlin:** It would depend how that was set up and how it was funded, and it would depend on the money stream. Would it be sustainable? Would they give you three years to do this in and then say, "That is the end of that. Forget about it and all go home"?

**Mr McWalter:** It might give you a five star on a research and assessment exercise because they would know what they were assessing. That would be a start.

**Q498 Dr Iddon:** How much guidance do you get from the World Health Organisation on your input into diseases in overseas countries?

**Professor Haines:** Our staff do a great deal of work with the WHO. As mentioned previously, I am a member of the Advisory Committee on Health Research. At the moment WHO is reviewing its whole strategy around health research. It has had a slightly unclear position up to now. In part it has been doing research, in part it has seen itself as a user of research findings, in part it has seen itself as a translator and disseminator of research findings. My own view is that WHO should largely be focusing on trying to find out what the global research priorities are in health, ensuring that health findings are properly utilised and ensuring that the findings are disseminated out to ministries and to the countries where they can be effectively used.

**Q499 Chairman:** I put it to you that without a Development Research Council you are floating in the wind.

**Professor Haines:** I think the proposal for a Development Research Council is a very interesting one. My concern, I suppose, would be that it is a multi-disciplinary area. Could one really encompass within one research council expertise across engineering, health, social sciences and so on?

**Q500 Chairman:** All the research councils interact through the RCUK now. Yes, is what you are saying. What do you think, Nick Winterton? Will you go back and tell your Chief Executive that this is floating in the wind?

**Mr Winterton:** I will certainly go back and say it is floating in the wind. We use the same bodies to advise on UK investment and on investment overseas because essentially there is a huge amount of overlap in many areas that are relevant to both, and therefore there would be a question of whether you were duplicating structures or whether you would be sharing structures because we would use, for example, our Infections and Immunity Board to judge applications whether they are relevant to disease, that is predominantly in the developing world, or not.

**Q501 Chairman:** That happens anyway.

**Mr Winterton:** Yes, making best use of your scientific advice.

**Chairman:** On that very positive note where we are all trying to improve things, I would like to say thank you very much indeed for coming along and helping us out. You will see the report some time after we get back from Malawi.



Wednesday 7 July 2004

Members present:

Dr Ian Gibson, in the Chair

Paul Farrelly  
Dr Evan Harris  
Dr Brian Iddon

Mr Robert Key  
Mr Tony McWalter  
Dr Desmond Turner

*Witnesses:* **Rt Hon Hilary Benn**, a Member of the House, Secretary of State for International Development, **Mr Steven Bass**, Head of Environment Profession, and **Mr Paul Spray**, Head, Central Research Department, Department for International Development, examined.

**Q502 Chairman:** Good morning. Thank you very much for coming, Minister. It is nice to see you, Hilary Benn, for the first time in front of this Committee.

**Hilary Benn:** Indeed.

**Q503 Chairman:** You will know that we have been to Malawi as part of our pursuit of knowledge in this field. The new President sends his regards to you and perhaps sometime I can tell you what he said about science and technology. He is overwhelmed by it, very keen on it, so we think we struck the right note. We were very glad that Paul came with us on that trip. It was really very worthwhile and brought us up sharply in terms of understanding the problems and enabled us to see the quite inspiring work that is going on out there. They work very hard in a difficult situation. We were very gratified to have that opportunity. We are glad to have you here to summarise it all. Would you like to say a few words?

**Hilary Benn:** Not really. I would prefer to go straight into questions if that is all right with the Committee. Paul Spray, I think you know, is now making his hat trick of appearances before this Committee.

**Q504 Chairman:** He is a stalker *par excellence*. He followed us around the bars of Malawi too!

**Hilary Benn:** On my right, could I introduce Steve Bass, Head of Profession Environment, who is I think making his first appearance, as am I.

**Q505 Chairman:** I hope you enjoy it.

**Mr Bass:** Thank you.

**Q506 Chairman:** We hope we can unsettle you, as best we can without falling out perhaps. When are you going to appoint a chief scientific adviser in DFID? It is expected; it is rumoured; it is talked about. Is it going to happen?

**Hilary Benn:** Yes.

**Q507 Chairman:** When does the advert go out?

**Hilary Benn:** As soon as we can. The first thing I want to say is that the inquiry you have undertaken has had a profound impact, certainly on me and on the Department. This is not idle flattery, because it is not. It happens to be true. I think this has been a really good example, if I may be so bold as to say so, of a select committee doing a really important piece of work and having an influence. As far as the

relationship between select committees and government departments are concerned, I think this is how it should work, because if we do not inquire and listen to each other and reflect and respond, then the system does not work very effectively. Having followed closely the evidence that you have taken and the work of the Committee, we set up a team of people to look into the question, with some support from Sir David King, who suggested one of the names of the people to sit on that group. They reported to me just over a couple of weeks ago with the recommendation that we should appoint a chief scientific adviser. I would take the opportunity today to announce the fact that we intend to do so because I think the Committee deserves a lot of credit, alongside others, for the fact that I have now taken this decision. The straight answer to your question is to get on with it as quickly as possible. There are a lot of issues about precisely how the process is going to be structured and so on which we have not yet worked our way through, but I wanted to take the opportunity this morning to say yes we are ready to do so.

**Chairman:** I am sure every member of the Select Committee can stand a little bit of flattery now and again.

**Q508 Mr McWalter:** It will not make us nice, tough, Chairman!

**Hilary Benn:** Having for my bedtime reading last night read through every single one of the evidence sessions—

**Q509 Chairman:** Good grief!

**Hilary Benn:** Yes!—I am only too aware of the fact that flattery, idle or otherwise, will not protect me from sharp and probing questioning.

**Chairman:** The axis of evil runs through our Committee!

**Q510 Dr Turner:** You must have had a ghastly night. Could you give us assurance that the chief scientific adviser's job description will be that of a strategic adviser rather than a superior line manager?

**Hilary Benn:** We have not yet determined the job description, but whoever gets the post, if he or she is not about giving strategic advice then they would not be doing the job certainly that envisaged for the post because I think it will add to the work that we have already been trying to undertake. I think it will

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add to the considerable amount of work that DFID funds and supports in the field of science and technology, and I see that post-holder as having a really important role to play. We need to work out exactly how that is going to function within the structure of the department as it is currently established, but, yes, that would be fundamental. Why should we be interested in all of this? Why have you been interested in having done the inquiry? I digress slightly from the question but I want to make this point: the challenge that DFID has as a government department is to try to help to improve the condition of humankind. That is what we are about. In doing that, we ought to reach out for all of the means that are available to help make that happen right across the piece. Science is a really important contribution to make to improving the condition of humankind. We see it from history, we see it from the work we are funding now and we see it in the challenges that lie ahead—and I can go into that in a bit more detail if you would be interested.

**Q511 Chairman:** We are going to come on to that.

**Hilary Benn:** For all of those reasons, giving good strategic advice to me and to the rest of the department on where we should be focusing our resources and effort and so on, is to me fundamental to the job and to my decision to make the appointment.

**Q512 Chairman:** No job description—that is tolerable, I guess, because it is a new initiative—but I would like to know at what level you contemplate appointing this individual for the post. How would you equate it on the civil service scale? It is not going to be a lowly post, hopefully.

**Hilary Benn:** No, it is not going to be a lowly post.

**Q513 Dr Iddon:** Will the salary be commensurate with CSA in other departments?

**Hilary Benn:** Yes, it will be. My understanding is that for CSAs in other departments there is a range they are on, but, yes, it will be commensurate with the pattern that we can see, recognising that there are differences between departments in other government departments. No, it will not be a lowly post.

**Q514 Chairman:** Whilst it is very welcome you making this appointment, there is a very obvious question why it has taken so long to get there. Given that the Chief Scientific Advisor has been recommending it for some time—Sir David King has mentioned that he is very keen on making sure that science permeates every department at the highest level—why has it taken so long in that Department?

**Hilary Benn:** I think the honest answer is because we thought we had ways of dealing with science that meant that we could do without the post and we have come to the conclusion that actually that is not the case. In taking the decision that I have to make the appointment, I think it will enable us to make use of science better but building on a lot of work the department has done. Whilst some of those who

have come and given evidence to you have been deeply critical (having re-read all the evidence last night), some people have said, “No, actually it is not like that, and actually there is a lot of good work going on.” I have been genuinely interested myself to understand why people have felt this way. I think—and this in part answers your question—that it has in part been a consequence of the changes that DFID has been through in the way that we work. If you go back in history, there was a time when we had chief advisers for lots of different scientific disciplines. Reflecting upon the process of change within developing countries supporting it is a very complex business. The real challenge we have is to joint all of these bits together. You need the contribution of science; on the other hand, if you do not have a functioning state then it is very hard for anything to happen, whether scientific based or anything else: getting kids into school, making sure that people have health care. So we have been working our way through that. The restructuring of the policy division, which I think is the second driver of this, took us a couple of goes to get it right. I do not think DFID should apologise about that because I am firmly behind the arguments that drove that change and an organisation which reflects on restructuring and says, “We have not quite got this right and we need to think about it again,” I think deserves credit for being able to think, rather than saying, “No, we have made the change, we are going to stick with it, whether it is working or not.” I think that is a strength of the organisation, because it shows it is willing to listen and to learn and to reflect. But we are where we are and now we have a very clear way of going forward. In a sense, I am less interested in how we got to this point and what really interests me is how we are going to go on from here.

**Q515 Chairman:** You have had a policy division restructuring and you also have a research strategy now. Say you are interviewing me for the job—and you are looking for a high-flyer, of course—my obvious question would be, “What rights do I have? How can I institute any changes in that research strategy and the policy division changes?” You have put the cart before the horse as far as the interviewee is concerned, have you not?

**Hilary Benn:** I am not sorry, I am not quite sure I follow.

**Q516 Chairman:** If you were being interviewed for a job, you would want to have an input into the research strategy and any restructuring to make that research strategy for science and technology really fly, would you not? You are giving a job to somebody when you already have that in place, are you not?

**Hilary Benn:** well, I am not sure that is entirely fair. We have to get on with the job. I had not taken a decision until three weeks ago that this is what we were going to do.

**Q517 Chairman:** Three weeks ago you made the decision?

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**Hilary Benn:** The 23 June was the report of the group of three who had been looking into this. They took a couple of months, did they not? Something like that—maybe slightly more—if that. I did this because I thought we needed to have an answer to the question, which is the question you have been asking repeatedly with all the people who have come and given evidence. At the same time, it would not have been right while that process was going on to say, “We are not going to produce the research strategy, we are not going to try to consult people.” With hindsight, maybe the timing has not been ideal, but we are where we are, and the research strategy, in my view, has to be a living and evolving document—so it is not cast in stone: that is it and nothing is going to change subsequently—and of course whoever gets the post will have a very important influence on the research strategy.

**Q518 Chairman:** Thinking about the person who gets this post, will it be somebody who has a knowledge of physical and chemical sciences, or are we going to get another social scientist? I say that—

**Hilary Benn:** Yes, I saw the curl of the lip when you said “another social scientist”. If I may say so, I had a conversation with somebody in Oxford on Monday who came up to me and said, “I see you are just interested in hard sciences nowadays. I hope the social sciences are not going to get forgotten in DFID.”

**Q519 Chairman:** They did not say the “soft sciences”.

**Hilary Benn:** Well, I am still coming to terms with the terminology, to tell you the honest truth. There is a lot of interest in the work that DFID does and I spend a lot of my time trying to persuade people that actually DFID is interested in their area of work. I suppose it is one of the consequences of a department that does a lot of good work, has a lot of outstanding people and there is a great deal of interest in what we do. Part of the problem is to wrestle with all of these competing priorities. But, no, we will be looking for somebody who has undoubtedly great credibility within the scientific community and somebody who knows about development, because if we do not have somebody who has credibility, including in the natural and physical sciences, then I do not think it is going to do the job.

**Q520 Chairman:** I think you will have seen the questions we have been asking about how many social scientists do you have against other types of scientists. I think the message is fully hammered home and hopefully will permeate the discussions at some level.

**Hilary Benn:** Yes. I would simply say that it is not a competition; it is a collaboration between the different branches of science. That is my view. If we do not have collaboration, we are not going to deal with the problems. We have to have that.

**Chairman:** The absence of the natural sciences would be noted, I think in the scientific community.

**Q521 Dr Turner:** When you approach a country in terms of poverty reduction strategies, does that strategy represent the priorities of the developing country which you are addressing or is it a summation of the agendas of the major funders involved? What is the relationship there?

**Hilary Benn:** This is a really interesting and important question. If we are honest, there is one of a number of tensions in the field of development—we might as well be straight about it—and DFID has been and is, I think for good reasons, a very strong supporter of the principle of (in the jargon) “country ownership”. In the end, who has the greatest interest in the future of a country? The government; its people; its communities. On the other hand we have views and knowledge and information about what works better than other things in helping development to take place. And we also have a very long queue of people who are constantly battering me over the head saying, “Are you raising science and technology in the discussion about PRSPs? What are you doing about water? Are they giving enough priority to reproductive and sexual health? What about education?” The truth is we continue to try to work our way through how we balance things. I was much struck, if I may say so, having listened, by the adjournment debate that Tony McWalter undertook on Monday evening in the House. The truth is it ought to be a combination of push and pull—because that was the example you gave. It cannot just be about us sitting wholly passive and saying, “We have a blank piece of paper, tell us entirely what you want?” because it has to be based on a dialogue. On the other hand, if there is not a very strong sense of country ownership, if we end up, as donors, by our influence or the way we go about it, in effect writing the PRSP, then it does not form a living, breathing document which the country wants to take forward and work on. We are not trying to achieve something that is written to satisfy the donors; we want countries to draw up their own plans for their future and then talk with us about ways in which we can help, ways in which, as far as you are concerned, science can support that work. But it is quite hard going, because in some areas people do want us to be more didactic about what should go in and we have to find a balance.

**Mr Bass:** It is true to say the early PRSPs could be characterised as documents, as plans; almost as planners’ dreams. Our intention is to ensure that over time they become the basis of continuous improvement systems, so that they would be more characterised by systems than by a document. Acknowledging that a country-driven approach is the way forward, our input is to ensure that the dialogue and the diagnosis is improved in-country. We are not determining the outcomes but we are making sure that the right stakeholders are at the table, that they have the chance to prepare the right kinds of questions and to go through them. For example, in the area of environment and environmental sciences, we have prepared a 20-part question dialogue which probes deeper and deeper into why environmental science matters. We are trying to develop an approach which could be

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summarised as: “Who counts most? Who are the stakeholders who really depend, for example, on environmental resources and ought to be at the table?” Enriching the country-based dialogue, enriching the diagnosis, we think is a way forward. Of course, when that dialogue and diagnosis starts to point to certain matters, then our advisory network can come in and help to engage with the people in developing countries to move towards solutions.

**Q522 Dr Turner:** Clearly you are dependent upon some reasonable form of government being in place in that country, and other countries, such as one not very far removed from Malawi, you would find it exceedingly difficult to work at all.

**Hilary Benn:** Yes. The nature of our involvement in developing countries varies enormously. That is why I made the point earlier about effective functioning states. In the end, we should all be interested in trying to help establish effective functioning states that can do the job that we look to our own government to do, which is to look after us when we are sick, to educate our children, to provide opportunities for people to work and improve their living standards, to promote science, to do a whole range of things. In some countries it is very, very difficult just to start. In Darfur in Western Sudan, where I was four weeks ago, none of that is on the table, because the priority at the moment is trying to keep alive the million-plus people who have had to flee their homes because their villages have been attacked, their possessions looted, their men folk shot, the women raped, and they have had to run away with their possessions. We are spending a lot of money rightly on the humanitarian aid effort but also trying to encourage those who in the end have to fix the politics that gave rise to the conflict. Really the whole spectrum, from really well-established genuine dialogue and discussion with functioning governments that are doing their best and are making progress—and we can point to a lot of examples of that—to really dire circumstances of that sort.

**Q523 Paul Farrelly:** We have seen firsthand in Malawi some of the excellent work that DFID is doing, not least, in our trip, the AIDS programmes, the TB and anti-malaria programmes. In Malawi we saw very strong support for the programme support. In consequence perhaps of two things: first, because of the corruption problem that has grown, and, secondly, because of the quality of scientific support they got through that mechanism. You mentioned country ownership. Country ownership is great, but it depends on who is doing the assessing of what is best, whether it is politicians (who may be compliant in corruption) or the people on the frontline. How do you assess what is the right balance country to country between budgetary support and programme support? How do you address the issue of corruption through budgetary support? In moving from programme support to budget support, how have you assessed the changing pattern of the technical and scientific advice and support that DFID will be providing?

**Hilary Benn:** What is interesting in this debate about budget support, as opposed to programme or project activities, is that there is in some quarters an impression that somehow DFID has moved entirely to budget support and all we do is sit and write cheques—which is not the case. Direct budget support over the last few years has ranged between 15 and 19% of our total bilateral programme. That means that over 80% is not direct budget support. We need to get this in balance. What is the case for budget support?—and I will come on to the issue of corruption which you have raised. The case for budget support is this: if a government has the means, the organisation, the capacity to do the things it wants to do—if you take the 16 countries in sub-Saharan Africa with which we have a particular relationship: these are our target countries as far as the Public Service Agreement is concerned linked to the Millennium Development Goals—is it better for us to say, “That is all very interesting but we are going to come along and build a school here or run a health clinic over there,” or to say, “You have the means and the capacity but you are just short of the cash to make it happen,” and give them support to enable that to occur? For that decision to be taken, you have to be confident that they have that capacity, and a lot of what we do is about helping to build and sustain that—you know, systems that work. If you have the money, can you get it down the line to the person who is going to have to take decisions about paying teachers’ salaries and maintaining schools and providing accommodation for teachers? In a number of places I have been to, you have the school but it is very hard to get a teacher to come and work there because there is nowhere for them to live. These are very fundamental things and it shows how all of this has to connect together. You also have to be confident that the money is going to be used for the purposes for which it is intended, and, therefore, if there are concerns about corruption that is not a route down which you would want to go. We make a judgment depending on the circumstances. Tackling corruption is fundamental. It is one of the governance issues about which we go on at great length, because if you have corruption it gets in the way of effective and functioning states, it means that money does not reach the people whom it is intended to benefit—not just donor money but government revenues. If government revenues are being siphoned off, then that does not help. The other thing I would say—again, let’s be honest—is that it is more difficult to judge and assess the impact. If you have a school you have built or a health clinic that you run, you can put a flag on it and say, “We did that”; but the truth is that in circumstances where we are giving budget support the judgment is, “Let’s look at social expenditures. Is the expenditure on health and education going up? Is the country in that sense moving in the right direction? Are more kids going into school? Are more people being treated?” We can see some very clear examples. Kenya abolished school fees. We gave some money to help make that happen and one million plus extra kids are in school. I am sorry it is a long answer but

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that is the sort of range of things we take into account in trying to decide what the balance is between project and programme and budget support.

**Q524 Paul Farrelly:** It is country by country and case by case.

**Hilary Benn:** Yes, country by country, case by case.

**Q525 Dr Turner:** If the development outputs are going to be sustainable, there has to be a transition from programme to budget support. I think we felt that in Malawi was a good case example of where you have to make that decision. For instance, we met the National Research Council who have no budget worth counting, very doubtful whether they have the expertise there to be able to do the job, but if the work was going to be, as I say, sustainable then somehow both of those things have to be created. There is clearly a great challenge for DFID and other donors to manage that sort of change. Do you have any views on how to go about it?

**Hilary Benn:** It is extremely difficult. Malawi is the first African country I visited and that visit brought home to me the sheer problem of lack of capacity right across the piece. I would say the priority in Malawi is to ask ourselves how can we maintain capacity, whether it is in scientific expertise, whether it is in teachers, doctors, nurses.

**Q526 Chairman:** We are going to come on to capacity.

**Hilary Benn:** I think that is the big priority for Malawi, whatever the area it is, because, with people dying off at the rate they are, because of HIV/AIDS in particular, if we do not address that question then the prospects for the country are, frankly, pretty bleak.

**Q527 Paul Farrelly:** One of the things we saw from Malawi is the struggle they are facing to get the free AIDS drugs out there to the frontline: when, a year later, they go into some of the frontline places, the hospitals, they report statistics that 50% of supplies were pilfered along the way. That is not the case on programme supports, such as the very practical distribution of mosquito nets, because DFID make sure the mosquito nets get to where they are intended. How is DFID addressing that problem, which again is a problem of corruption in a particular country, but also a global policy towards the freely available AIDS drugs?

**Hilary Benn:** On tackling corruption, in the end countries have to take this issue seriously, have to make it clear that there is a price to be paid if you engage in corruption. If people do it, then they need to be brought to account, because that is one of the way that societies send messages about what is or is not acceptable. The second thing would be to work to find ways to deal with the problem of supplies leeching out of the system, because it is clearly not effective if that happens. On AIDS in particular you need both the medicines and an infrastructure that is capable of delivering it. Without both of those, it is very hard to make progress.

**Mr Spray:** On the Malawi case, where we identify particular places where it looks as though corruption is making a big impact, then, through our office there and through the High Commissioner there, we can make representations at the highest level.

**Q528 Dr Iddon:** Have you done that in the case of leakage of drugs? We have had anecdotal evidence that hospitals were ordering drugs for the central store in Lilongwe, they were dropping off the backs of wagons and the agents were either selling them to private clinics or even parallel trading them for maximum profit back into Europe. That is a clear case that we should be tackling. The drugs were not getting to the people in the district hospital that we visited.

**Hilary Benn:** The straight answer is that I do not know in relation to that specific case. I will gladly find out and let you know if that would be helpful. In general, we go on a lot—if I can use that technical term—about corruption because it is fundamental to deal with these problems in making states work effectively and making sure that scarce resources are used rather than being diverted.

**Q529 Dr Turner:** The Millennium Development Goals are, if you like, common speak for the international aid community but do they necessarily reflect the needs of any given country? Do you feel that they ever distort patterns of aid? One example which struck me personally in Malawi, for instance, was that there was not enough emphasis on water and energy.

**Hilary Benn:** No, I do not think the Millennium Development Goals distort. I think they focus the world's attention on some really important things that we need to do. There was always going to be an argument about how many goals you had: if you had loads and loads and loads, then that might dilute the focus. I think they have had a very powerful effect on the international system because they force us to ask the question: How is what we are doing contributing to halving absolute poverty or getting those hundred-odd million children who are not in primary school into school? I think they have had a very powerful impact from that point of view. Water is a genuinely interesting question. We have asked ourselves this. In drawing up our water action plan—which I do not know whether you have seen—I have been quite concerned that water was not figuring very prominently in the PRSPs the countries had drawn up. We asked ourselves the question: Why should that be? Part of the answer may be because responsibility for water tends to be down the system of government at local level and the negotiations about the PRSP happen to be at national level. We have changed our policy, so that now in discussion upon the PRSPs we will specifically raise the issue of water if we think it does not figure in the way that one might think it should, precisely because we know that a clean water supply is fundamental to tackling diarrhoeal diseases,

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getting girls into schools and other things like that. We have changed our policy on that, reflecting on precisely the question you have asked.

**Mr Bass:** I have noticed that the Millennium Development Goals have really drawn donors in the UN system together, in the sense that they have provided a lingua franca. I think they have also opened up the door to science and technology more because they have that long-term goal. We are talking 2015, we are talking about problems for which there is no immediate solution and therefore research is required. We have just joined the UN Commission on Science and Technology for Development. I attended this year's meeting—in fact, as one of the few donors there amongst a huge science and technology community. We found the construct of the Millennium Development Goals a very good way to begin to bridge any gap that might exist between the science and technology community in developing countries and development agents. So, yes, any set of targets might distort if you forget the spirit in which they were produced, the Millennium Declaration, but at the moment they are very helpful for uniting communities.

**Q530 Mr McWalter:** Are you of the view that all the scientific and technological knowledge required to solve the problems of developing countries is now in existence and that all that is required is to apply it?

**Hilary Benn:** No.

**Q531 Mr McWalter:** Do you think DFID should be making a contribution to the development of new knowledge? Do you have mechanisms for doing that?

**Hilary Benn:** Having said no in answer to your first question, the truth is of course that we need both and it is a moot point where the balance of responsibility for the develop of the new knowledge should lie between the research programme that we fund and research that other people and other organisations fund. We certainly need to make sure that we have systems in place to tap into the new research where it can be used and applied in a way which helps tackle the problems for which we have responsibility. The truth is I think we have a shared interest unquestionably with HEFCE, with the other research councils, and therefore a shared responsibility, but we have to make choices about where we put our money, even though our research budget, as you know, is going to rise. I do think at the same time it is very, very important that if we have, as a result of scientific research, knowledge that can make a difference, we have to make sure it is taken up and used and applied. If we do not do that collectively, we are not actually making the best use of all the investment that has gone into the scientific research in the first place. That is why you see in our research strategy and the work that we undertake and the information and other things that we do, we put a very strong emphasis on trying to make sure that it is used, so in the end it makes a difference to people's lives.

**Q532 Mr Key:** Secretary of State, do you believe that science and blue skies research has a role to play in meeting the needs of developing countries?

**Hilary Benn:** Yes, unquestionably.

**Q533 Mr Key:** Do you think DFID should sponsor basic science research?

**Hilary Benn:** I was trying to answer the question in response to Mr McWalter. Some of what we do may do that but I think our particular priority has to be to find the science which is going to be usable to make a difference in developing countries. If you like, that is the particular end of the market where we have a particularly important role to play because it is about its capacity to make a difference to people and to be able to use it.

**Q534 Mr Key:** Yes, but I am particularly interested in who is going to do that in the Department. Could I congratulate you on both your ministerial statements yesterday on UN-AIDS and sexual and reproductive health.

**Hilary Benn:** Thank you.

**Q535 Mr Key:** I was delighted to see that the UN-AIDS Secretariat is going to get an extra £36 million over four years and UNFPA is going to have an extra £80 million over four years. What assessment was made before that decision on the scientific content of each of those programmes?

**Hilary Benn:** UN-AIDS' function within the international system is to raise awareness of the problem of HIV/AIDS, and of course they have published their 2004 report; to try to improve the co-ordination within the international system in the fight against HIV/AIDS; to identify areas that are emerging, for example, problems of the epidemic in parts of the world which are not getting the same attention as sub-Saharan Africa, so the emerging epidemic; and to bang on about the importance of strong leadership in countries in the fight against HIV/AIDS. In terms of scientific research, that is not what UN-AIDS is leading on. In that field, you will have seen the work we have done, for example, in microbicides research. That is a really good example of a very hard and practical science. There are clinical trials starting in five African countries this year and DFID was the first development organisation, the first government to fund that research. Why? Because it goes absolutely to the heart of the prospects for development in sub-Saharan Africa and elsewhere. Because if people continue to die of HIV/AIDS the prospects for development are really bleak.

**Q536 Dr Harris:** In your document published yesterday, *Sexual Reproductive Health and Rights*, you say, "There is now a large and growing body of knowledge in what works to improve sexual reproductive health." You also say, "When used correctly and consistently condoms are highly effective at preventing sexually transmitted infections and HIV infection . . ." How frustrating do you find it that the major donor in the world is withdrawing from those sorts of services, which

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must put pressure on DFID budgets to fill the gap, when the United States says they are not going to look at condom programmes?

**Hilary Benn:** We take a very different view. Referring back to Mr Key's question a moment ago, of course one of the consequences of that approach has been the withdrawal of funding from the United States to UN-FPA. That is one of the reasons why we are such a strong supporter because it sends a very clear message about the importance of the work they undertake and it is very practical. The evidence is absolutely clear. That is why one of the most practical contributions that DFID makes is to help to distribute a very large number of condoms because it is about saving people's lives.

**Q537 Dr Harris:** There is no mention of this major problem, of the major donor in the world not doing this and everyone else therefore having to do it. There is no mention of that in this paper. Are you under pressure not to criticise and not to draw attention of your ally, the United States, to the huge evidence base that this is an important factor in controlling and trying to do something about the devastating HIV epidemic?

**Hilary Benn:** No, we are not under pressure. I am not under pressure, and I would not be. I mean, I say what I think. We take a different view. It does not mean we cannot work together with the Americans in other fields, which we seek to do, but on this specific question we are quite clear that the use of condoms is a really important contribution to preventing the spread of HIV. That is why we distribute a lot of condoms, that is why we support UN-FPA.

**Mr Key:** Sir David King made a plea to us to persuade DFID to take science "out of the box". Do DFID staff now recognise the relevance and value of science technology and research in terms of national developments?

**Mr McWalter:** I have a supplementary question on that: I would be grateful for non-medical examples, because the Medical Research Council has a very strong record in terms of having first order research programmes which clearly are of use and flexibility to developing countries who do not have that structure, say, with engineering research.

**Q538 Chairman:** Or agriculture.

**Hilary Benn:** Of research that we have funded?

**Q539 Mr McWalter:** Taking science out of the box was the question and I wanted you to give examples that were not medical.

**Q540 Mr Key:** Tony was qualifying the question.

**Hilary Benn:** I am still grappling with the concept of taking science out of the box.

**Q541 Mr Key:** Could I help then?

**Hilary Benn:** Yes, of course.

**Mr Key:** You may recall that when you made a statement to the House of Commons a month ago, when you had recently returned from Darfur, I asked you in a statement whether DFID have

actually considered using satellites to aid both the political stability problem, the problem of migration of people and the analysis over a number of years of what was happening in terms of land use, infrastructure like bridges, roads and so on, and you very, very generously said you had not thought about that. I actually asked you to mention it to Kofi Annan when you spoke to him that afternoon and I wondered what progress you had made on that front.

**Q542 Chairman:** Top of the list.

**Hilary Benn:** It will be top of the list now! I do owe you a response. Genuinely reflecting upon it, one of the other issues it raises in conflict situations, like Darfur, is to what extent might technology help us to find out actually what is going on, who is moving where, who is doing what—which is an issue in Darfur. It is actually also an issue in the Eastern DRC, where the topography is a lot more difficult to understand what exactly is going on. Going back to the first part of your question: Do staff in DFID understand the importance of science and technology? if implied in that is somehow the suggestion that staff in DFID in the past have not understood the importance of science and technology, then I would not accept the premise of the question. Are we currently engaged in a process to try to improve the way in which we understand its importance and imply it, the answer is unquestionably yes. As I said right at the beginning, the Committee's inquiry has really helped us to do that.

**Q543 Mr Key:** What about satellite? I only the day before yesterday had an email from Oxfam who have been using Danish satellite interpretation facilities to help them to co-ordinate their own programme in Darfur.

**Hilary Benn:** I was not aware that was the case.

**Q544 Mr Key:** I always try to be helpful, Secretary of State.

**Hilary Benn:** I know you do. As well as responding to you, I will contact Oxfam to find out about what it is they are doing and how they are doing it.

**Q545 Mr McWalter:** Professor Bradley from the London School of Hygiene and Tropical Medicine said "... the idea that DFID can simply 'buy in' research as needed is naïve and fails to understand the nature of the linkage between research, expertise and sound advice." In a sense, we have the scientists-on-tap idea, which it seems Professor Bradley is suggesting is the DFID model, as opposed to extending co-ordination between scientists and others in seeking to solve the problems of developing countries. That is the basis of other evidence like that that suggests that science is marginal in terms of core activities in DFID when you think you can go and get an expert to give you some advice and you will put that into a system solution.

**Hilary Benn:** I know Paul wants to say something and then I will come back.

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**Mr Spray:** I think Professor Bradley is wrong. Of course Professor Bradley speaks from the health background, which you asked us not to reflect on.

**Q546 Chairman:** Touché.

**Mr Spray:** As you saw perhaps in Malawi, there are examples where we do have somebody in-house who is an agricultural specialist but there are also international organisations and the Consultative Group for International Agricultural Research and Malawian institutes that we try to triangulate between. I entirely accept your point that it would be bonkers to have a set of generalists in DFID who were then calling in experts. We need to have a body of knowledge within DFID, and that is one of the reasons why we are recruiting these research managers with a strong scientific background.

**Q547 Mr Key:** Chairman, may I say, on reflection, that it might have been Christian Aid who emailed me. I will check that.

**Hilary Benn:** Could you, and perhaps you could let me know.

**Q548 Mr Key:** Of course I will.

**Hilary Benn:** Thank you very much.

**Q549 Mr McWalter:** How, if at all, have you contributed to the development of the forthcoming 10-year investment framework for Science and Innovation in the UK? I suspect the answer is you have not done, which means therefore your priorities will not be reflected in that very large budget.

**Hilary Benn:** It is a very good question and I do not know the answer to that. Your surmising may be correct.

**Q550 Chairman:** When we hear the announcement next Monday our obvious question would be: Did you ask DFID? You do not think they did.

**Hilary Benn:** All government departments were asked to contribute to the 10-year strategy. We have had a lot of discussions with the Office of Science and Technology. At the time, we sent them the draft research strategy and said, "These are the kinds of issues about which we are concerned."

**Q551 Mr McWalter:** Could you put a figure on that—how much of the £10 billion figure you would like?

**Hilary Benn:** Not that I am aware of.

**Mr Spray:** Not in a specific request, no. We obviously have a figure on our research strategy, but we did not.

**Mr McWalter:** You will remain the Cinderella relative to that initiative.

**Chairman:** You have not asked the Treasury how much you are going to get. I would have.

**Q552 Mr McWalter:** So should your chief scientific adviser have done, had he or she been in place.

**Hilary Benn:** They will be before too long.

**Q553 Chairman:** What are you doing to improve the flow of information between your centrally-funded research programmes and the country offices? There is an issue there. Do you need to improve that flow of information and interaction and so on? Is it part of the DFID research strategy?

**Hilary Benn:** It is. We have a number of things that we are doing, including the ID 21 site. I do not know whether anyone has had a chance to look at that. I think it is getting 30,000 hits a month—which shows it is being quite well used. It is an important source of information, not only for our country offices but also for those undertaking scientific research in developing countries and for those who do not have access to the internet there is a paper copy that is available and goes round. The second thing I would say is that, through the appointments of the heads of profession, as part of this process of iteration in the development of the Policy Division, one of their very specific responsibilities—and Steve may want to say something from his perspective—is to ensure that that knowledge works down the system to the advisers to whom it will be of particular interest.

**Mr Bass:** The advisers who are appointed in-country are encouraged not only to focus on particular activities that DFID is supporting in that country in question but also to network with local scientists, civil society, observers of development, so that there are other routes in which to pick up the issues and the solutions in-country. They are encouraged to do that. Every year, each of the advisory groups holds retreats at which the findings of the year, the new research findings and new issues, are addressed. We have one next week where we are bringing together the DFID engineers, the agriculturists and the environment groups to look at shared issues. There is not only the ID 21 site that we support but also the SciDevNet site which is open to—

**Q554 Chairman:** Which of these are recent events?

**Mr Bass:** The recent event is the fact that we now have 10 heads of profession in 10 areas, four of which are natural and physical sciences, now charged with reinvigorating our network so that they get better involved in the developing countries, so that they get better involved in our research programme—and there is a strong appetite for that, for people's own professional development if nothing else.

**Q555 Chairman:** You seem quite satisfied with it as it is.

**Mr Bass:** I am satisfied with our plans—and many of them are plans at this stage. I suspect that as we begin these plans we will start to see the things that work best. Indeed, we may find an annual retreat is not the best way forward, but we are trying different things.

**Q556 Chairman:** Despite all of this, there is an NAO report which said, "In framing their programmes country teams recognised the importance of learning lessons from elsewhere but they felt they lacked



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support in identifying relevant information amongst the large amount of technical data available.” That is quite damning, is it not? They are not getting the support and help they need to pull out the kind of things that are important.

**Mr Bass:** Half the time of the head of profession is to be able to bring together good, new evidence and information and to share it; half our time is on professional development.

**Q557 Chairman:** There is evidence and evidence. There is counter-evidence this way and that. Should you have a triple-jab, a single jab?—and all that kind of stuff. They need that kind of guidance.

**Mr Bass:** Sure. One thing that the chief science adviser would add to the heads of profession is bringing systems of rigour, systems for each head of profession to be able to handle new science, to be able to disseminate new ideas. We are all looking forward to such a post to make us work more efficiently.

**Q558 Chairman:** That is a big move.

**Mr Bass:** It is a big move.

**Q559 Chairman:** Somebody will take the initiative, make the strategic judgments.

**Mr Bass:** Yes.

**Hilary Benn:** Genuinely, I do not think it would be fair to say we are satisfied because we recognise that we can do more. On the NAO report, are you referring to the one on HIV/AIDS?

**Q560 Chairman:** Yes, I am.

**Hilary Benn:** One of the specific points that NAO made was there was a request from our people in the country offices for better guidance on the use of anti-retrovirals. That is something we will respond to. The new HIV/AIDS strategy is going to be published in the very near future and we recognise the point they made.

**Chairman:** You will know that we saw the clinic when we were over there. Inspiring work the people are doing in very difficult circumstances will be a memory that is with us for a very long time. Any help and support they could get, we would absolutely want to be supportive of.

**Q561 Dr Turner:** There did seem to be an eminent need for more technically qualified staff on the ground to support those programmes. Would you think it appropriate for DFID to put in more DFID people, to supply the lack of capacity which countries like Malawi lack on the ground?

**Hilary Benn:** This is something we are looking at as we speak because it was the thing that struck me most from my visit to Malawi when I went. The Permanent Secretary visited not all that long ago and we are currently looking at precisely what we can do in answer to that question because, as I indicated in answer to you earlier, the fundamental problem in Malawi is a lack of capacity on a whole range of fronts. What can we do? Do we need to do things that we have not thought of doing before, in order to make sure that there is capacity, frankly just

to keep the show on the road, while the country struggles with the development challenge that it faces.

**Q562 Dr Harris:** Can we be more specific about things that are being considered to tackle the tragedy that there is, which is the limiting factor? It is not the supply of drugs or, indeed, despite the problems, the supply of condoms or tests, but it is people not there on the ground to do it.

**Hilary Benn:** What we are looking at is in what way and by what means might we be able to get people to come to Malawi to provide support to that capacity? That is the central question that we are asking ourselves. I cannot tell you what the answer is going to be, but that is what we are looking at currently.

**Q563 Dr Harris:** One of the questions that was raised in the open discussions that we had with your people there, was the question about whether the money might go in to direct budgetary support, to increase salaries across the board in the healthcare sector, to try to retain people, and they were talking about a doubling. Are you aware of that proposal, and what research has been done into whether that is the right factor by which to increase salaries?

**Hilary Benn:** If I may ask, who was that conversation with?

**Q564 Dr Harris:** I think it was with the head of the DFID in Malawi.

**Hilary Benn:** Roger Wilson.

**Q565 Dr Harris:** Yes.

**Hilary Benn:** Certainly one of the things that we are looking at there and in other countries is indeed the question of salaries. Malawi may be slightly different because of the capacity problems because of HIV/AIDS, but if one thinks of other countries one of the push factors that forces people to leave the country is low pay, lack of opportunity for career development, lack of opportunity in effect to use the skills that doctors have acquired in their training in the places where they will be asked to practise. When I was in Ghana I was surprised by the extent to which the Head of the Ghana Health Service, instead of criticising me, as I expected him to do, for us recruiting doctors and nurses from Ghana, what he spoke about most of the time were the push factors that lead people to leave. What your question demonstrates is that if we do not, working with developing-country governments, address those push factors it is going to be very hard to retain the people or persuade them to come back.

**Q566 Dr Harris:** My question was what research are you planning, because I got the impression that no research is being done, and I suggested that it might be a waste of money giving twice the salaries, if it did not work. What about three times? What about bringing from Britain to Malawi, on their NHS salaries, exactly the same number of staff that have been effectively poached—I grant you not

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deliberately—by the NHS from Malawi? Is that not a plan? What research is being done? Is this an area where you can ask people why they leave?

**Hilary Benn:** The honest answer is that I do not know what research has been done by Roger Wilson and his colleagues in relation to that specific point in Malawi.

**Q567 Dr Harris:** He told me none.

**Hilary Benn:** He said none?

**Q568 Dr Harris:** None, and I understand that you have to do something now because it seems to me that there ought to be research into these areas, critical though they are, and it worries me that there is not a research thinking culture. How do we research this before we jump in, and should we have done it years ago?

**Hilary Benn:** I will reflect on that.

**Mr Spray:** On the general issue we do have a five-year development research consortium centre looking at issues of migration—generally, not specific to Malawi.

**Q569 Dr Harris:** I am not sure there is much more to say; it is a terrible situation. We spoke to people in Malawi who said that they knew of nurses who had been in the hospital in Lilongwe the month before, who were now working in Britain, some of them, somehow, in the NHS, which is dreadful because their need is greater than hours, despite the political pressure on the NHS here. How high a priority is there to look into what can be done to ameliorate it and why it is still happening, despite everyone saying that it is a terrible thing?

**Hilary Benn:** We have the Code of Practice, as you know. The problem is, it does not apply to the private recruitment agencies. We are talking to the Department of Health about ways in which it might be strengthened. There is a difficulty on the other side: how far do you actually go to say to someone from Malawi, or elsewhere, who decides that this is what they want to do for their own lives and their own career development, to say, “No, you cannot do it”?

**Paul Farrelly:** Just for the record, the statistics that we were quoted by the Permanent Secretary, their equivalent thereof, in the Health Department, they trained 480 nurses last year only 80 of whom are now working in Malawi in the Health Service.

**Chairman:** The President flagged this up to us as a priority.

**Q570 Dr Iddon:** It is not just a double whammy in the fact that professionals are dying, almost as soon as they graduate in some cases, with HIV/AIDS, and the nurses and doctors are being drained out to Britain and other countries, but the triple whammy is the fact that there are international donors setting up beautiful new buildings, like the University of North Carolina has set up a very nice new building on the site of Lilongwe Central Hospital, and they need staff to run their health project there, an HIV/AIDS project, and the nurses and doctors are coming in from the hospital on whose site that is

based, and they are coming in for a 100% commitment to the University of North Carolina Project. On the other hand, we saw Professor Molyneux operating in Blantyre on a malaria project, but he was insisting that his staff spent 50% of their time on the general wards of that particular hospital, which seems highly sensible. The management at the Lilongwe Central Hospital said that the ratio of nurses to patients was 1 to 80, which I found quite terrifying, and you could see the results of it on the wards. How much influence could DFID have in persuading other donors to adopt best practices according to the Code of Conduct that you have just outlined?

**Hilary Benn:** In the end each donor is responsible for what they do and we have to be responsible for what we do. Incidentally, I think that for some of the nurses from Malawi it is not just about coming here, they may go to countries like South Africa. So the movement is south. There is an issue there and an interesting conversation generally to be had about South Africa taking nurses from Malawi. The contrast between the two examples that you give is an interesting one.

**Q571 Dr Harris:** They replaced the South African nurses working here in many cases.

**Hilary Benn:** This is a system of global migration, and the question is: what can we do by our own efforts to try and limit that flow? On the other hand, what can we do to help build capacity in Malawi so that they can retain and keep people? The example that you give of the 50% requirement to work in the general wards is a very interesting one. At the same time—I come back to the point that I made earlier—how far does one go to prevent particular individuals taking particular decisions about their own lives? I think there is a genuine difficulty and dilemma there.

**Q572 Paul Farrelly:** I would like to press Brian's set of points in relation to the University of North Carolina in Lilongwe. I am mindful that this is not an investigation into international development and approaches in Malawi, but clearly it will be influenced by what we have seen there. The University of North Carolina, as it was related to us by a number of people, when it comes to announcing a new research project they put an advert in the local paper, there is no cooperation, no agreement, as with other programmes, as to where the priority is to release that, and then with each project the hospital loses another five or six nurses and the balance is that they now have 83 nurses against just over 100 out of a theoretical complement of 500 for the hospital, which is quite shocking. Had we found DFID supporting science research in that way in Malawi we would have been extremely critical. So Brian's question, for which we would be grateful for an answer, how does DFID approach this on an international level, in terms of trying to get common standards between donors as to what is the acceptable way of going about research, and what not? Secondly, can you give us an assurance that that sort of situation that you find at the University of North Carolina in Malawi, but not with DFID, is

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not the cases in other countries? Can you give an assurance that DFID does not go about conducting projects in that way in other countries, with that impact on the frontline staff in the country concerned?

**Hilary Benn:** We certainly would not wish to go about projects of that sort in that way because we are acutely conscious of the knock-on effect, which that example of the University of North Carolina throws into very stark relief. As I say, each donor is responsible for the decisions that they take and it is, as you, them and not us. As far as what we do internationally to try and deal with the consequences of this, different donors do work in different ways. Some donors are very, very wedded to the project approach and we have some difficulty, frankly, in persuading them to move in the directions that we have been moving in, in terms of budget support and sector-wide programmes and so on and so forth. There is a constant dialogue and debate, but not all countries share that same view; some countries are much happier with continuing to do project approaches which they can put their flags on and to say that this is a very specific contribution from country X to the development of the country. I think the best contribution that we can make is to demonstrate the beneficial impact that, in our view, the right approaches have, and, at the same time, demonstrate the damaging effect that the wrong approaches can have, but I will not pretend that we can persuade everybody all of the time if they are doing things which have the impact that that example you have given demonstrates.

**Q573 Dr Iddon:** Secretary of State, you referred earlier to a tension that is fairly obvious in your work, and that is between short-term emergencies of the kind that you have referred to in Darfur, and longer-term capacity building, which we are concentrating on at the moment. How does the international donor community strike a balance between the crisis situations and the obvious need to build capacity over a much longer period?

**Hilary Benn:** That is a very difficult question. Let us take the most immediate crisis, which is Darfur. If you look at the pattern of who has done what and who has given what, some countries have done a lot more than others. In the case of Darfur the two biggest bilateral donors have been, first of all, the United States and, secondly, the United Kingdom. We have done that because it is the most serious humanitarian crisis in the world today and there are a lot of people whose lives are at risk. I do not think we can stand on one side and say, "We are very sorry about that but we are not going to strive as hard as we can to make sure that people do not die." The second honest answer is that different international donors have particular relationships with particular countries. In terms of the division of labour—and there is a division of labour within the system—you look at where the UK's development programme is and you will find a strong correlation with our colonial past; that is a fact. Not completely, though, because we have a growing programme in the Democratic Republic of the Congo—not part of our

colonial past. Why? Because we now have an opportunity to try and move from crisis—although it is very fragile in the Congo—to some prospects for development of that country if the politicians can stay together and avoid continuing fighting in the east of the country. So I think it is a combination of how different countries respond to immediate crises and the nature of the relationship that they have with particular countries. But we do not sit down in the international community and have the discussion in the way that I think your question implies, because it is very much the product of decisions that individual countries take.

**Q574 Dr Iddon:** Is that causing you a problem, because there are an endless number of these crises, particularly in Africa, when it comes to the other major work of your Department, which this Committee is interested in, and that is the long-term capacity building? Is it draining the resources out of that?

**Hilary Benn:** No, I would not say that. In the end we have to take decisions about how we are going to use the resources that we have, but we have a sharply rising aid budget, as you well know, and that has been one of the projects of the last seven years in contrast to what went before, which is very striking, and one of the things which we can do is to come before the Committee today and say that we are going to be increasing our research budget because that is a product of having a rising aid budget. So it makes it easier to deal with those difficult choices than would otherwise be the case.

**Q575 Dr Iddon:** We saw some work at the Polytechnic in Blantyre, of the British Council. What is your relationship with the British Council in terms of capacity building?

**Hilary Benn:** Obviously they do a lot of work with tuition of the English language, people studying and links with higher education. We have the Higher Education Links Scheme, which I have redirected. There was a debate about whether it should continue at all and I decided that it should continue, with two different focuses. One is with a greater focus on science and technology and the second is that it should have a greater focus on students coming from poor countries. It is a very cost effective scheme because we have put a bit in and it levers in a lot of extra resources, and that is why I took the decision that we should maintain it. Other ways in which we work with the British Council, Paul?

**Mr Spray:** They are obviously contractors for us in a number of programmes where we want to do long-term capacity building, and they will bid.

**Q576 Dr Harris:** I want to finish off this issue about capacity and follow-up, and what Brian Iddon was saying about the conflict. The number of Malawian nurses working as nurses in this country can be counted through registrations with the Nursing and Midwifery Council on an annual basis?

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*Hilary Benn:* Yes.

**Q577 Dr Harris:** There is a moral argument, in my view—and you may or may not agree—that because we can measure it we can try to send people back in equal number from our own nursing and medical community, who may well be motivated, on NHS salaries, so that we can be morally neutral in respect of that drain, so that we can count the drain and equalise it. But I can see the problem that if that had to be funded from DFID budgets then it would mean switching resources from fire fighting and other issues to deal with this problem. Has it been put within Government that, given the historical problem of us having under capacity in our own workforce—without going into whose fault it is—means that there is a responsibility on our Health Service and its budgets to replace that lost capacity because it is cruel and unfair to have the impact of undermining the doctors' and nurses' capacity in Malawi that they so desperately need?

*Hilary Benn:* The direct question, has it been put? No, not as far as I am aware.

**Q578 Dr Harris:** Would you consider it?

*Hilary Benn:* I am sure John Reid would have a view on that question and I think it raises all sorts of issues which are difficult. I think what we should focus our attentions and efforts on is the ways in which we can make the Code of Practice more effective, and the piece of work that we are currently undertaking, which is asking ourselves the question: what can we do to get the capacity either to return to Malawi or to stay in Malawi, taking it as an example? I think we have some research that we are funding on that general area of work. Is that not the case, Paul?

*Mr Spray:* Yes. As I said, this five-year migration long-term research is indeed looking at those kinds of areas.

**Q579 Dr Harris:** But there is no specific research on push and pull factors? I think we have established that.

*Mr Spray:* Not specific to Malawi, but there is plenty generally.

*Hilary Benn:* More generally, yes, there is, because your question was specifically about Malawi.

**Chairman:** We should not just focus on Malawi all the time.

**Q580 Dr Iddon:** We have obviously been discussing the countries which are at different stages of development, and I am sorry to mention Malawi again, but there are basic science and technology systems in place in Malawi, as far as we can see, albeit with major problems. Other countries are even further behind that and I would like to ask the Secretary of State, what is your department specifically doing to build the capacity of S & T systems in countries where they are almost non-existent?

*Hilary Benn:* I suppose it depends which countries you are talking about, and it depends at what point of development they are at. It is an indirect

contribution, but my attention has been drawn to an example from Nigeria, where they had at the Ahmadu Bello University a world-class medical research centre in the 1970s. In the 1980s it ceased to function. Why? Because the staff left. The labs and equipment were unused—why? Because of the economic crisis, salaries unpaid, insecurity, repression. That is, if you like, an example of a backward movement. What can one do to contribute to that process reversing, to try and tackle the underlying causes? Because in those circumstances if they managed in the 1970s to have a world-class medical research centre, but these are the factors that have meant they no longer have them, then putting time, effort and energy into dealing with the conflict and the causes of repression, effective payment of salaries, economic stability, all of the things that DFID works on, that is an indirect contribution, but in the right circumstances if you do that then other things will flow from it. I think it is important that we do not neglect that because if you put the effort in to try to establish the facilities but the state did not function and there were other factors that were working against it, it would have been best that that had not worked.

**Q581 Chairman:** There are lots of organisations that have put money into that situation that you are talking about, Wellcome, MRC and others. Does that still happen, that three or four people get together and say, "This is a priority", discuss the politics and so on, and then each throws their hat in the ring?

*Mr Spray:* The Secretary of State met with the director of the Wellcome Trust just yesterday and we were talking about a number of different examples where with, not just British Institutions but also, for example, the Gates Foundation, we do indeed try to sit down and work out ways, and one of the things that we hope we may be able to take forward is joint capacity building support with a number of these institutions.

**Q582 Chairman:** Would you say it is still in the foothills, that that is another area that we could do better on?

*Mr Spray:* We can always point to examples where we have done successful things in the past, but I certainly hope that this is going to be looking forward.

**Q583 Chairman:** It sounds like we are closing places and that is not the situation we want to endorse, is it, we want to be opening new places? If British science is to fly in the world they would be a great contributor in international development. So that is a priority, at a guess.

*Mr Spray:* Clearly we would want to talk to Research Councils as well as to Foundations in this case.

**Q584 Mr McWalter:** The UK capacity to help, which, as you are probably aware, I take the view that that is in fact weakening as time is going on. To

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quote my friend again, Professor David Bradley, who you will probably disagree with again, who has a very good line on an overall view, I think, says: “Contrary to DFID’s recent lack of interest in the matter, there is a need for the UK to fully accept responsibility for maintaining its own expertise and so its ability to help effectively.” Would you say that DFID has any responsibility for the UK capacity to conduct research of relevance to international development?

**Hilary Benn:** As I think I indicated in answer to an earlier answer, we undoubtedly have a shared interest and therefore we do have a shared responsibility. As you will know, the way in which we go about this, particularly since we untied aid, in my view for entirely the right reasons—and I know that has been an issue that we have looked at in the course of the inquiry—the fact is that 72% of the contracts which we have let have been won by UK researchers, and most of the rest have been won by developing countries. I do accept that there is an issue that has been raised with you about the need to have a level playing field for UK researchers, and that is something that we are looking at. Yes, we do have a shared interest and therefore we do have a shared responsibility but I do not think that we can have the responsibility on our own.

**Q585 Mr McWalter:** In fact Professor David King, the Government’s Chief Scientist, gave evidence to us on 26 April, when he said that DFID should take the lead in ensuring that the UK retained a core competence in international development and science. That is something rather different from, “We will just share.” I agree with David King, by the way.

**Hilary Benn:** I got that, but then Simon Maxwell, who you also took evidence from, said what I have just said, which is about it being a shared responsibility, and I happen to believe that to be the case. I do not think it can be just down to DFID.

**Q586 Mr McWalter:** If you did take the lead that would hopefully act to create an increasing capacity to be able to do a lot of this work?

**Hilary Benn:** It depends what the consequences of advocating taking a lead would be, in terms of the balance of our research activity and where we put our funding. I come back to the point that I made earlier, that, yes, we need to make use of all of the product of the research that is undertaken, but we have a particular responsibility because we are a Development Agency, having to make choices about where we use our resources, which we will inevitably have to do, and those that are going to have a real and significant impact on the lives of poor people in poor countries. To me, that is the really important test.

**Q587 Mr McWalter:** Would you then support—and it sounds as though you would not, but I would like to follow this through—the creation of a UK funding body specifically focused on development of science and research?

**Hilary Benn:** It is a genuinely interesting proposal. There would be advantages to it because it would have the focus, which you pointed to in your speech on Monday night. On the other hand, it might have the effect of saying to the rest of the Research Councils, “We do not have to worry about that any more because somebody else has that responsibility.” In all honesty, I think there is a genuine debate to be had about which would be most effective in trying to achieve the objective that you have set out in asking the question.

**Mr Spray:** I would like to say that since Mark Lowcock appeared before this Committee we have written to the Research Councils, precisely to investigate ways in which we can work more closely together and move the development agenda up their total agendas.

**Mr McWalter:** Can I point out that clearly leaving it at the moment deep within the bowels of the Social Sciences Research Council might not be the best way of dealing with these matters.

**Q588 Dr Iddon:** We have had the feeling from the academic community that they want to help but they are being frustrated in a number of ways in not being able to help, either through a lack of structures, obviously through a lack of funding and so on. What influence does your Department have on academia in general? For example, do you have any interaction with the EU Framework Funding Mechanisms, with the Research Assessment Exercise, because that is killing off departments, quite frankly, that could and are willing to help, which seems totally against what this Committee is trying to press forward this morning. What influence does DFID have with institutions that interact with the academic environment to try and get them pointing in the direction of international capacity building, for example?

**Hilary Benn:** If I can deal, first of all, with the expression of frustration that you referred to in asking the question, Mr. Iddon. I am very conscious of that, one could not read the evidence without being aware of that. I think in all honesty we have not been as good as we ought to have been in explaining what we have been doing, because I do think it is one of the things that come out from this inquiry. Secondly, we have not in the past quite got the structures right for enabling us to access that goodwill, that interest and that commitment, and we are trying to fix that, and the appointment of the Chief Scientific Adviser will, I think, play a very important contribution in making that difference. You mentioned the EU Research Framework Programme. I think I am right in saying that that has about 600 million Euros in it between 02 and 06 on development research through INCO. Interestingly the UK, I understand, has the highest success rate in making bids for that programme.

**Mr Spray:** Just on the EU, we are part of the Government’s discussions on the policies on the Framework Programme, and in particular we would like to see a number of rather detailed proposals on how development might be better addressed in

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Framework 7 than it is at present. On the RAE there are indeed some interesting questions about impact, on how the RAE might be able to measure impact.

**Q589 Chairman:** Can I bring this section to a close by bringing up an immediate problem, which I hope you have been facing? There are a lot of people doing research and development but because there has been a delay in working out strategies and programmes they are caught in a situation where they do not know what the future is going to be after 2005. What we would like to know is when can they start tendering for new contracts and what kind of topics do you think will be highlighted? They are in a muddle, their job is coming to an end, and the short-term contract business, and you have to make sure that there is going to be a future for them so that they do not dive off to become lawyers and such.

**Hilary Benn:** I am sure there is no prospect of that! The first thing that we did, because we recognised precisely the point that has been raised, was to extend the arrangements for a further year in order to give people greater security, and that we have done since you started the inquiry. The second thing we have done is to set out in the research strategy what the full priorities are. I think the closing date for the consultation is the day after tomorrow, so we are still waiting to have a final look at what the result of that consultation is going to be. I accept the point that you are making, that we need to give people certainty about what is going to happen and the direction in which we are going to move as soon as we possibly can.

**Q590 Chairman:** Could I ask you to think about it over the next few months, so that the programmes do continue because we will all be in bad order if those programmes, whatever they are, disappear suddenly?

**Hilary Benn:** Point taken.

**Q591 Dr Iddon:** And we might lose the skills in the teams that exist now.

**Hilary Benn:** We do not want to do that.

**Q592 Dr Turner:** Your budget is distributed partly through multilateral agencies, mainly the EU and the UN. How do you decide how much of your budget is going to go through that route, and how do you evaluate how the use of this money through the multilateral agency is going to contribute towards delivering your own departmental development objectives?

**Hilary Benn:** Are you asking specifically in relation to science or more generally how we make those decisions?

**Q593 Dr Turner:** More generally, and if you can be specific about science so much the better.

**Hilary Benn:** More generally, the first thing we would do is to look at the effectiveness of the contribution that the multilateral system can make, and we are trying to move towards having a better system for judging the effectiveness of different bodies. So if one looks at the different UN agencies

we are in the process now of developing a matrix of trying to judge who is doing a good job, who is doing a less good job and for us to adjust our funding accordingly. It is a perfectly rational, sensible thing to do, and it is something that I am particularly interested and keen that we should do. For things like the World Bank, IDA, all the evidence demonstrates that they get a very good rate of return on the investment in development that they make and we are very strong supporters of that. There are other areas. EU Development Funding I could highlight, where, as I think everybody knows, it has not been terribly effective in the past. There has been a process of reform taking place that the UK has played a very strong part in pushing, and we have seen some improvement. There is further improvement yet to be made. As far as research specifically is concerned, I suppose one reason that would drive us in the multilateral direction would be to try to avoid duplication; secondly, where research costs are high; or where, by making a contribution multilaterally, we can help to lever in other money from other people, and our contribution to CGIAR is a good example of that. They are doing very good work; we had the presentation we put on in the House last week, and there is clear evidence that the increased funding that we have committed to CGIAR is helping to get more money for them from other people, and that is a good thing.

**Mr Bass:** One of the conclusions of the UN Commission on Science and Technology for Development, is that there is a real lack of co-ordination amongst the UN agencies on science and technology capacity, utilisation and development. There is very little basis for co-ordination. Of course, that hampers that if the UN is not co-ordinated. So one of the reasons for engaging in this Commission, so that we can help them through the mapping exercise, the SWAT analysis, if you like, is to move the UN towards better use of science. Nithin Desai, who was the Secretary General of the Johannesburg Summit on Sustainable Development, also pushed the point that the UN bodies as a whole were not properly linked to science and were not reflecting on science advances and science uncertainties. What I am saying here is that this is one reason to engage in this Commission as one of the few donors doing so.

**Dr Turner:** All I can say is that you have not only answered my first question but you have answered the next two or three questions as well!

**Q594 Chairman:** This has been an absorbing session. I have never said that in all the time I have been in the Chair; I have found it very interesting, and your responses have been very positive and indeed helpful, and I think the work that we are doing jointly will be a credit to everybody in the field, so I am very pleased with that. One last question: what would you like us to put in the report? I cannot congratulate you, of course, it is not our style!

**Hilary Benn:** I was not expecting that for a second!

**Q595 Chairman:** Something that you suggest and we will put in and you will say, when we have the debate on the issue, "Yes!" like you started today. It would

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be novel for a Select Committee to give you everything you wanted. Perhaps this could be a first time?

**Hilary Benn:** I think it would be interesting—it is not for me to tell you what to put in your report—if you acknowledged what DFID was doing anyway, because I think the truth is in the middle of the different range of evidence that you have, and I know you have worked very hard to encourage people to be straight and direct in what they had to say, and some people took up that invitation. I do not mind that at all! I finish where I began, that genuinely this has been a process in which we have tried to learn and you have helped us to do so, because in the end we do have a shared interest in this. Where I come from, being a non-scientist, is very simply this: that DFID has the task of trying to help to improve, as I said at the beginning, the condition of human kind. We only have to look back in history to see the contribution that science has made. If we did not have vaccines for smallpox and for polio then a lot of people who are alive today would be dead, and we are now close to eradicating polio in the world. That is a huge advance. If you had said that 70 years ago people would have said, “Wow! That would be fantastic if we could do it,” and science has helped to make that happen. We look at our own history and the contribution that scientists and engineers have made to vastly improve

life expectancy in Britain when they made the connection between dirty water and cholera and then the sewers and the water supply systems got built, which did more than anything else to transform the lives of constituents in the cities that we represent. The third issue is, look at the problems—people dying of AIDS, lack of agricultural productivity, the fact that the green revolution in Asia has not transferred to Africa—and what are we going to do about these things? Finally, with the knowledge that we have, how can we apply it so that it actually makes a difference on the ground? That is the question that I try to ask myself every day: how is what we are doing actually making a difference somewhere? In the end, that is what we should all be judged against, and I am very grateful to the Committee both for the inquiry and for your searching questions, which we have done our best to try to answer.

**Chairman:** Thank you for coming today and being very candid indeed and helpful. May I say that when we have done our report that you will answer it, no doubt, for the Department and there will be a debate. I just want to say that as long as this Committee is in existence—and who knows when the election will be—we will return to this subject to see if what we have set up is achieved. We always try to follow-up our inquiries. Thank you very much indeed for coming.

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# Written evidence

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## APPENDIX 1

### Memorandum from the Department for International Development

#### PREAMBLE AND INTRODUCTION

1. *Government policy on development is set out primarily in two Government White Papers. Within these, science has a clear role*

The 1997 White Paper *Eliminating World Poverty: A Challenge for the 21st Century* (CM 3789), says “Sustainable development to eliminate poverty rests above all on the achievement of economic growth that is not only stable and vigorous, but which embraces poor people and allows them to share in the fruits of development.”<sup>1</sup> “Knowledge, research and technology underpin all our work. The elimination of poverty and protection of the environment requires improved access to knowledge and technologies by poor people.”<sup>2</sup>

In the 2000 White Paper *Eliminating World Poverty: Making Globalisation Work for the Poor* (CM 5006), the Government committed itself to “seek to increase public and private sector research for development, including through new mechanisms.”

2. *The Department for International Development’s (DFID) aim is to contribute to the elimination of poverty in poorer countries, in particular through achievement by 2015 of the Millennium Development Goals (Annex 1)*

Capturing progress in science, engineering and technology for the benefit of the poor helps DFID to do this. Better utilisation of science in development policy and practice can help save lives, reduce poverty and improve the quality of life.

#### *Science Policy*

3. In order to enable science and technology to be better integrated into Government Departments’ policy, the Office of Science and Technology developed its “Guidelines 2000”, to address the role of Government Departments in the process of obtaining and using scientific advice. Guidelines 2000 is an important element of the Modernising Government programme and the Government is committed to seeing it implemented across departments.

The key messages of the Guidelines are that Departments should:

- think ahead and identify early the issues on which they need scientific advice;
- get a wide range of advice from the best sources; and
- publish the scientific advice and all relevant papers.

4. DFID contributed to the *Cross-cutting Review of Science and Research 2002*. The Review made a number of recommendations aimed at improving the way Government departments manage and use science to deliver their objectives. DFID’s current position on the recommendations of the Cross-Cutting Review are detailed in Annex 2.

#### *DFID’s past research*

5. DFID funds research as part of the collective international effort focused on removing constraints and creating opportunities to reduce poverty. DFID can only fund research that stands a good likelihood of contributing to the reduction of poverty. In practice, the results of DFID funded research have contributed significantly to improvements in policies and institutions in important areas of economic and social and physical development including:

- management of renewable natural resources;
- water supply, transport and energy;
- information and communications technologies;
- HIV/AIDS and other key communicable disease;
- child, reproductive and maternal health;

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<sup>1</sup> paragraph 1.17.

<sup>2</sup> paragraph 2.42.



- sustainable livelihoods; and
- economic and social policy issues.

Some examples from the above are at Annex 3.

6. DFID's expenditure<sup>3</sup> on research in 2001–02 was £147 million, of which £78 million came from centrally funded research programmes. The sectoral division was approximately:

<i>Sector</i>	<i>£ million</i>
Economic policy	9
Education	2
Infrastructure and Urban	14
Environment	1
Rural Livelihoods	36
Health and Population	16
Geographical Departments	69

#### *Health as an example*

7. DFID's 2002 review *Research for poverty reduction* gives a very complete picture of DFID's past research effort, including some of the impacts on reducing poverty.<sup>4</sup> Nevertheless, it may be useful to take one sector and lay out some detail of the research programme.

8. DFID is a significant funder of research into health and development. UK research institutions have some of the best health and development capacity in the world. Whilst DFID tends to prioritise the funding of operational research, with the assumption of a quick return on better delivery of health services, we also fund basic research around developing new research tools, and the development of new products and technologies. The latter tend to be through public private partnerships. Outlined in Annex 4 are some examples of areas that we fund, and how DFID uses science to inform its work in the field.

#### *A new research strategy*

9. In 2002, DFID conducted a public consultation and review on DFID research policy. The resulting paper *Research for Poverty Reduction* provides much information on DFID's research and its impact. It made a number of recommendations on how to help strengthen elements in order to maximise the poverty reducing potential of the research we fund. A copy is attached<sup>5</sup>.

10. In April 2003, all DFID's centrally-commissioned research was brought together under a Central Research Team in order to have a more holistic approach to tackling researchable problems. The Central Research Team is currently reviewing the approach, initiatives and delivery mechanisms of DFID funded research.

11. A new research strategy is currently being developed, which should be ready by the end of the year. We will make a supplementary submission to the Select Committee once the strategy is agreed. Meanwhile, we can indicate the direction of thinking, assuming that the strategy follows the 2002 review *Research for Poverty Reduction*.

12. The objective of the new research strategy lies in the DFID's Public Service Agreement goal: "To develop evidence-based, innovative approaches to development." Within that, we might define an objective for research as: "To promote the production and uptake of technologies and policies that will contribute to the Millennium Development Goals." We expect to commission research that (i) is targeted on areas that will make a real difference to the poor, and (ii) has excellent channels through to poor people, so that there is a big chance they can benefit from the outcomes. The outputs of the programme are for the benefit of poor people, and are used by organisations and individuals tackling poverty: field practitioners, policy makers, donors and multi-lateral organisations. The major innovations in this strategy are to address those two issues, as highlighted in *Research for Poverty Reduction*.

13. DFID plans to re-balance the allocation of its research resources between broad subject areas, with greater emphasis on larger, more strategic, longer-term research initiatives, focused around priority problems rather than on "sectors". Allocation of resources will be guided by:

- the expected impact of the research on the development outcomes to which DFID is committed;
- how far there is a gap in knowledge and in funding—depending on what other research funders are supporting;
- the scope for DFID to leverage in other funds; and

<sup>3</sup> Figures taken from *The Forward Look 2003: Government funded Science, Engineering & Technology*. DTi/OST.

<sup>4</sup> On impact, see especially *Research for poverty reductions* Annex 9.

<sup>5</sup> Also available at [http://62.189.42.51/DFIDstage/News/Consultations/files/research\\_surr.pdf](http://62.189.42.51/DFIDstage/News/Consultations/files/research_surr.pdf)

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— DFID’s comparative advantage.

14. If the strategy follows the recommendations of *Research for Poverty Reduction*, it might include seven instruments:

- A substantial “bilateral” programme, of broad “Knowledge programmes” commissioned directly by DFID;
- Greater international collaboration;
- Public-private partnerships for pro-poor technology;
- Greater investment in communication—to and from researchers;
- Some support for DFID country offices seeking to support national research capacity;
- An initiative to engage more with other funders relevant to the development agenda across Research Councils, Whitehall and other UK funders; and
- A modest but innovative horizon-scanning programme.

15. Some of these areas are familiar from DFID’s past practice—notably the bilateral programmes. Papers have been commissioned on the other six aspects, and are available on the internet.<sup>6</sup> International collaboration is increasingly important. DFID is actively engaged in European and International research fora, for example the European Initiative for Agricultural Research for Development (EIARD) and the Consultative Group on International Agricultural Research (CGIAR).

Public private partnerships are promising in fields such as livestock vaccines: they are dealt with further in paragraphs 57 to 66 below. Likewise, support to capacity building is dealt with in paragraphs 37 to 48, and engaging with other UK funders in paragraphs 24 to 28. But we should say something here about the other two aspects—communication and horizon-scanning.

#### *Communication*

16. The effectiveness and impact of international research for poverty reduction depends on other elements in wider “knowledge systems” which are often weak or under-funded in developing countries. One aspect of this is good communication. Good communications in research programmes are based upon establishing working partnerships between researchers and policymakers or users throughout the research timetable. DFID is supporting better international systems for managing research knowledge, so that those who need it can access it. More emphasis is now placed upon capturing poor people’s needs, and so creating demand-responsive research systems, nationally and internationally.<sup>7</sup> As evidence has emerged that research take-up is higher when users are involved in setting the topics and involved through the life of the research, DFID has strengthened projects by encouraging local participation.

17. DFID already emphasises the importance of sharing research results with those who can use them and makes the results of research it has funded freely available as a public good. Most DFID-funded research is summarised in accessible language, and put on the internet through an innovative website [www.id21.org](http://www.id21.org). DFID provides some incentive to contractors to promote the commercial application of their work where there are opportunities to do so but retains control on how the intellectual property is exploited

18. A key area of knowledge transfer accessibility is the availability of research and thematic programmes in the continuing improvement in webpage based databases allowing searches by subject country or key words. DFID believes that this will greatly enhance the secure storage and dissemination of work outputs. DFID also invests in a wide range of activities to improve communication of research to developing countries, including participatory processes, use of mass media (radio, television, video, printed press); workshops; and developing products for use in face-to-face service delivery.

#### *Horizon-scanning*

19. DFID is exploring the establishment of a “horizon scanning” activity. In last year’s science strategy, Investing in Innovation the Government concluded that departments need a more forward-looking strategic approach to setting research priorities. For example, the Department for Environment, Food and Rural Affairs (DEFRA) has established a horizon scanning research programme which identifies emergent risks affecting its policy domains and to explore novel ways of framing long-term research problems, by consulting research users and research providers. Likewise, the Department of Health’s National Horizon Scanning Centre provides advance notice of significant new and emerging health technologies.

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<sup>6</sup> Website references: [http://62.189.42.51/DFIDstage/Pubs/files/research\\_private\\_sector\\_1stdraft.pdf](http://62.189.42.51/DFIDstage/Pubs/files/research_private_sector_1stdraft.pdf)  
[http://62.189.42.51/DFIDstage/Pubs/files/research\\_international\\_study.pdf](http://62.189.42.51/DFIDstage/Pubs/files/research_international_study.pdf)  
[http://62.189.42.51/DFIDstage/Pubs/files/research\\_national\\_study\\_1.pdf](http://62.189.42.51/DFIDstage/Pubs/files/research_national_study_1.pdf)  
[http://62.189.42.51/DFIDstage/Pubs/files/research\\_country\\_study\\_draft1.pdf](http://62.189.42.51/DFIDstage/Pubs/files/research_country_study_draft1.pdf)  
[http://62.189.42.51/DFIDstage/policieandpriorities/knowledge/new\\_dfid\\_research\\_strategy.htm](http://62.189.42.51/DFIDstage/policieandpriorities/knowledge/new_dfid_research_strategy.htm)

<sup>7</sup> Examples include the International Focus Group on rural road transport with 26 countries involved, support to the information systems of the Food and Agriculture Organisation (FAO) and World Health Organisation (WHO) internationally, and at a national level to innovative demand-led agricultural research systems in Uganda and Bangladesh.

20. The advantage of a horizon scanning research activity is it allows and encourages research to be funded with a longer term impact, as well as helping to ensure that, in the future, there is an evidence base in place for shorter term policy requirements. Based on the model developed by DEFRA, a four-stage process could be envisaged:

- Scan and compile horizon scanning information and ideas: systematically collect information and ideas (eg, website solicitation for horizon scanning ideas, scanning for trends, new science developments, risk identification) and compile these centrally.
- Develop and prioritise horizon scanning issues: Use various approaches (eg, workshops, scenario work, critical reviews) to develop the scanning information into issues. Then prioritise horizon scanning issues, to determine any research needs or other actions.
- Conduct horizon scanning research: procure (either internally or externally) and manage research that explores the novel and unexpected research questions identified from the horizon scanning activity;
- DFID feedback: Central Research Team communicate outputs to other departments identifying appropriate responses for risks/opportunities that need immediate action. It will also be important to identify research outputs that need to be taken up by traditional R&D streams and/or contribute to evidence-based policy. By its very nature horizon scanning research will be high risk and therefore is unlikely to fare well against traditional peer review systems. Thus it may be appropriate to set aside “ring-fenced” funding and processes for procuring horizon scanning research, which may evaluate proposals on criteria other than scientific quality—such as the potential impact of the work. DEFRA, which has a similar sized R&D budget to DFID, has allocated £2 million per annum for this purpose.

#### *Other Government Departments*

21. This evidence focuses on the work of DFID. A wide variety of other Government departments and Research Councils are also involved in research on development. Some of these are mentioned in paragraphs 24 to 28 below. Another example is the British National Space Centre, detailed in Annex 5. Closer collaboration would be desirable.

The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID

22. *As noted at the start of this evidence, development policy, including the use of science, is set primarily in the two White Papers, and policy on the use of science more generally in the Cross-cutting Review and Investing in Innovation.*

23. *DFID has an extensive, untied programme of research support.*

This research programme is “untied”, with no preference to British suppliers, in line with the International Development Act 2002 which lays down that assistance provided primarily for purposes other than furthering sustainable development or promoting the welfare of people is not permissible even where poverty reduction is a secondary effect. So a policy of Aid Tying—where the primary purpose is to gain contracts for UK suppliers—would be unlawful. However, many British research institutions are the best in the world, and win open competitions for DFID (and other) funding. In 2002–03, 90% of DFID’s contract work for “advisory services” went to UK suppliers.

24. *There is some cooperation with the Research Councils, and across Whitehall*

Most Research Councils, and some other Government Departments, support research relevant to development. DFID has a long-standing concordat with the Medical Research Council (MRC). DFID has representation on the relevant MRC research boards and associated subcommittees, as well as on the Chief Executive’s Advisory Committee on research relevant to the health of developing societies. Since DFID has re-emphasised its strategic focus on poverty reduction in the period between 1997 and 2000, the MRC/DFID Concordat has created a mechanism for both partners to combine their research efforts in support of developing country interests. Unusually, the concordat includes a DFID financial contribution (currently £4 million pa). In addition, DFID funds a specific MRC programme on microbicides against HIV.

25. Examples of more informal collaboration include representation by the Biotechnology and Biological Science Research Council (BBSRC) on the programme advisory committee of a renewable natural resources research programme; DFID representation on review and advisory committees for relevant Economic and Social Research Council (ESRC) Centres, and contact with the ESRC’s Centre for Evidence Based Policy and Practice; meetings with the Engineering and Physical Sciences Research Council (EPSRC) with a view

to developing mutual working practices and utilising each other's strengths. The "in-house" centres of some Research Councils, such as the Natural Environment Research Council's (NERC) British Geological Survey, have won open competitions for DFID research programmes.<sup>8</sup>

26. DFID is represented on the Chief Scientific Advisers International Committee. Recent consultations across Whitehall include with DEFRA on livestock vaccines and horizon scanning, and with DTI on intellectual property rights, on which DFID established an International Commission.

27. *DFID input into joined up approaches is being strengthened*

As part of the preparation for the new research strategy, DFID commissioned a report on its potential role vis-a-vis other UK research funders.<sup>9</sup> This report is available at [http://www.dfid.gov.uk/Pubs/files/research\\_national\\_study\\_1.pdf](http://www.dfid.gov.uk/Pubs/files/research_national_study_1.pdf). It points out the limited involvement of DFID in cross-Whitehall discussions, and proposed DFID devote more time to it. Since the publication of the 2000 White Paper, Excellence and Opportunity: A Science and innovation strategy for the Twenty First Century and the 2002 science strategy, Investing in Innovation. A strategy for science, engineering and technology, numerous "Funders Forums" have been established. For example, NERC is in the process of establishing a Funders Forum on Environmental Research and DEFRA on Exotic [Animal] Diseases. The report for DFID suggests a UK Funders Forum on International Development, along the lines of Funders for the Environment, with the functions:

- to provide a "joined-up" and more coherent picture of research;
- to determine areas of synergy; and
- to identify and take action on any gaps in research.

DFID is considering these proposals as part of the new research strategy, and is just beginning discussions with other potential members of such a Forum. By its cross-cutting nature, this forum would be strategic and would operate as a means of exchanging information and ideas between those with a common interest. More specific sector focused issues could be picked up in other fora.

28. DFID is also engaged in cross-Whitehall discussions on science and technology policy including the EU Framework Programme, the research managers network, and interacting more regularly with OST to develop a more common understanding of approaches. This will include a learning event with the Government's Chief Scientific Adviser.

29. *Two recent events indicate that the time may be ripe for more to be done:*

- There has been a lively discussion in Canada on the role of developing countries in the internationalisation of research. The discussion involves Research Councils, universities, and the Canadian Government's International Development Research Centre. Much research is planned or carried out now internationally, rather than confined to one country. Clearly developments in information technology have contributed to this. A key issue is how far this includes developing countries.
- Dr R A Mashelkar, the Director General of the Indian Council for Scientific and Industrial Research received a very positive reception when he gave the 2003 Zuckerman Lecture in London, at the invitation of the Minister for Science and Innovation. He pointed out the value to science of developing countries, including their traditional knowledge. He challenged British institutions to engage in the fight against poverty. He proposed that the objective should be specifically to attack poverty—"the big challenge before all of us is empowering the entire human race not just a lucky few." He was particularly keen on collaborative work—promoting partnerships between developing country institutions, and between developing and developed country institutions. Research agendas should no longer be set nationally.

DFID is keen to play its part in taking forward such discussions within United Kingdom.

The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes.

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<sup>8</sup> Likewise, one of the stated aims of the Biosystem Management Section of the Natural Environment Research Council's (NERC) Centre for Ecology and Hydrology (CEH) is to "alleviate poverty by: domesticating tree species producing marketable timber and non-timber forest products for cultivation within sustainable land uses; and, promoting agroforestry, a low input sustainable land use that can be used by small-scale subsistence farmers to produce marketable products". As a result researchers at the NERC funded Centre also won grants from DFID's Forestry Research Programme.

<sup>9</sup> The report was carried out by RAND Europe, building on a recently completed report for the National Audit Office on Getting the evidence: Using research in policy making.

30. *DFID's key instrument for acquiring and using science is our advisory staff, who are located both in the UK and in our offices in developing countries. We have 474 professional staff in a wide range of disciplines:*

**Table**

**ADVISORY STAFF**

<i>Discipline</i>	<i>Total number</i>	<i>Number based overseas</i>
Health and Population	66	47
Social Development	58	32
Rural Livelihoods	62	41
Environment	23	8
Infrastructure and Urban	46	31
Economics	83	36
Enterprise	27	16
Education	41	28
Governance	45	27
Statistics	23	9

31. This is a relatively high proportion by comparison with other Government departments. We rank second, amongst Government Departments, after the Treasury, in the absolute number of economists employed.

32. *DFID advisory staff are under five Chief Advisers, some of whom have specialist sub-groups who are coordinated by Heads of Profession.*

DFID commissions resource centres to provide specialist knowledge where this cannot be found in-house and this compliments wider interaction with external institutions. Chief Adviser posts are normally externally advertised.

33. International agencies see DFID advisory support as a strength. Professional expertise is sustained by seminars, retreats, dissemination of materials and the use of resource centres, and by regular reading of key science and research journals. It is boosted by field experience, including dialogue with international (including British) experts commissioned by DFID to apply best practice knowledge to development programmes.

34. A principal source of access to good research and policy practice comes from UK membership of internationally mandated organisations such as the World Health Organisation, the Consultative Group on International Agricultural Research and the World Bank. Their capacities and mandates make them among the best sources of research and science advice. DFID contributes funds to these organisations to help them to maintain this role. DFID advisers—including advisers based in developing countries—have ready access to these knowledge bases.

35. DFID maintains a relationship with the UK science community, through research programmes, consultancy commissions, and recruitment and training of staff. This interaction is important to keep DFID staff at the cutting edge of knowledge generation and scientific endeavour in those areas directly related to our own operational work in developing countries. In the research field, examples would be the 14 Health Knowledge Programmes, run by UK university departments<sup>10</sup>; the 10 Renewable Natural Resources research programmes managed by UK institutions<sup>11</sup>; and the eight social science Development Research Centres, directed from UK universities<sup>12</sup>. In all these cases, DFID staff participate in dialogue with the programmes, to mutual benefit. Resource centres act as additional reservoirs of knowledge and as disseminators of research products. In the infrastructure area OASIS in water and TRL in transport have extensive expert registers and diverse networks that include local practitioners as well as developing country governments.

<sup>10</sup> The programmes cover: Health Systems Development Programme; Health Economics and Financing Programme; Effective Health Care Alliance Programme; Improving Perinatal Care to Reduce Infant and Child Mortality in Poor Communities; Reducing the Dangers of Pregnancy and Maternal Mortality in Poor Societies; Sexual and Reproductive Health—Policy and Practice; Opportunities and Choices Knowledge Programme; Safe Passages to Adulthood Knowledge Programme; HIV Disease, AIDS and Sexually Transmitted Infections Knowledge Programme; HIV/AIDS Knowledge Programme; Malaria Knowledge Programme (2 separate programmes); TB Knowledge Programme; TB Knowledge Programme Equi-TB.

<sup>11</sup> The programmes cover: Aquaculture/Fish Genetics, Fisheries Management, Post-Harvest Fisheries, Crop Protection, Crop Post-Harvest, Plant Sciences, Animal Health, Livestock Production, Forestry and Natural Resources Systems.

<sup>12</sup> The Centres are on Citizenship; the State; Competition and Regulation; New and Emerging Markets; Chronic Poverty; States in Crisis; Ethnicity; and Migration.

36. DFID is considering establishing a new Policy and Research Advisory Board, meeting twice a year to test and challenge DFID's policy and research agenda, and making sure that DFID is abreast of others' cutting edge work. Chaired at Director General level, membership might be drawn from three groups:

- disciplines, including a scientist nominated by the Government's Chief Scientific Adviser;
- users, largely from developing countries; and
- producers of policy and research.

*The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes*

37. DFID's country programmes primarily support the developing country's own Poverty Reduction Strategy. A Poverty Reduction Strategy allows a developing country to identify the opportunities for, and constraints on, poverty eradication in that country. The strategy is derived after consultation within the country. Donors, such as DFID, then link their aid support to achieving the Strategy. The approach has been taken up by almost all aid donors,

38. This switch to support for a Poverty Reduction Strategy came about in part as a result of research, not least by British scholars<sup>13</sup>. They demonstrated that development programmes were more likely to succeed if they were owned by developing country governments and people than if donors attempt to impose their own ideas. Amongst the British scholars producing evidence for this were John Toye (then Institute of Development Studies), Paul Mosley (University of Reading), John Weeks (SOAS), and Paul Collier (seconded from Oxford to be the Research Director of the World Bank). Some of this work was funded under DFID/ODA's research programme, and Collier by the ESRC. Addressing these poverty reduction strategies by identifying problems that may have researchable solutions and using science and technological innovation is core to DFID approaches.

39. Increasingly, therefore, DFID's aid goes in direct subvention to government budgets, rather than to investment in specific projects of any kind, including research. A major contribution to research is therefore through the government's allocation of some of its budget to research. For example, Ethiopia's Sustainable Development and Poverty Reduction Programme (SPPRP) identifies strengthening of the agricultural sector as a prerequisite for development. A key element of Ethiopia's agricultural improvement strategy is research and extension. Our response to this is outlined in the DFID Ethiopia Country Assistance Plan. Our main input to the SDPRP will be Direct Budgetary Support dispersed into the federal government central budget. A proportion will subsequently be allocated to agricultural research as deemed appropriate by the Ethiopian Government. That said, DFID may also directly provide technological and policy research inputs to specifically address food insecurity amongst rural people.

40. Within the projects that remain, we estimate that DFID country offices spent £69 million on research projects in 2001–02. DFID Country and Regional Programmes have made considerable investment in country-specific research over the last decade. Since 1994 it is estimated that, within the Natural Resource sector alone, 160 research projects with a combined value of over £300 million have been commissioned. Examples of successful ongoing research projects commissioned by Country Programmes in Renewable Natural Resources include:

- Smallholder Dairy Project, Kenya: the project is helping to inform and influence Kenya's dairy trading regulations to avoid discrimination against poor people who produce and sell milk;
- Poverty Elimination Through Rice Research Assistance (PETRRA), Bangladesh: collaboration between the Bangladesh Rice Research Institute (BRRI) and the International Rice Research Institute (IRRI) and other partners to develop improved rice production technologies appropriate to Bangladesh;
- Community Based Fisheries Management, Bangladesh: an action research project in partnership with the World Fish Center to develop and promote policies for the sustainable exploitation and management of inland fisheries in Bangladesh.

41. Where Country and Regional Programmes fund research it is because there is a demand for specific knowledge within wider rural development initiatives in-country. Here there is a direct linkage between knowledge generation and its application in national assistance programmes. DFID recognises that effective measures are needed to transfer knowledge to development practitioners and policy makers. We acknowledge that this is not simply a question of communicating research findings more effectively to end-users. To achieve real impact on poverty, research must also promote an enabling policy environment in which research outputs can be adopted. For this reason, DFID's emerging research strategy aims to improve communication linkages and provide stronger policy support in-country.

<sup>13</sup> A study on the origins of the Poverty Reduction Strategy approach is included in the DFID-funded research programme on Bridging Research and Poverty described in Annex 6.

42. Examples of programmes where these elements are already being put in place are:

**Bolivia:** The “Facilitating Innovative Technology” (FIT) Programme will realign DFID funded research in a coherent way around national priorities, working within the new national system for agricultural research development and technology transfer (Sistema Boliviano de Tecnología Agropecuaria—SIBTA). The focus will be on the rural poor, although the urban poor are also expected to benefit through more available, cheaper food, and improved employment opportunities.

**Tanzania:** Rainwater harvesting research has been funded for a number of years by DFID and is now a priority issue in the Tanzanian Government Poverty Reduction Strategy plan as shortage of water is one of the most important causes of income-poverty in rural areas. A support office has been set up in Tanzania with access to communication materials for a range of clients, and training courses attended by representatives from 42 districts (30% of districts in mainland Tanzania). At least one District Council has allocated a substantial budget for RWH in its Agricultural Development Plan.

**India:** The Government of India is promoting programmes to eradicate *Prosopis juliflora*—an aggressive weed invading irrigation channels and arable land. However, for many poor families, the weed provides their only source of income, when sold for fuel or dry season fodder. The DFID Forestry Research Programme is providing assistance with policy recommendations, briefing papers for different target audiences and a technical manual (in Hindi) for a series of training courses in management and utilisation of *P. juliflora* as productive, profitable and sustainable agroforestry systems.

43. The promotion of the whole system of innovation is particularly important.

- The issues identified in the Government’s *Investment in Innovation* paper tend to apply with even greater force in developing countries—especially that weak links throughout the innovation process hold back achieving economic or social benefits;
- As in Britain, a key element of DFID’s country programmes is to help governments lay “strong foundations of macro-economic and structural reform. Improvements in the investment climate, the opportunities for enterprise, and the acquisition of skills provide a more supportive environment for the exploitation of science, the development of new technology and subsequent investment in innovation, which in turn will boost productivity growth.”<sup>14</sup>;
- It is estimated that approximately two-thirds of avoidable deaths in developing countries could be averted by the use of technologies that are already known, but not taken up.

44. DFID has paid particular emphasis to research on how these weak links can be reinforced

- In 1982, DFID and MRC funded randomised trials of insecticide-treated bednets, which demonstrated a reduction in infant mortality of up to 30%, the greatest effect of any single intervention yet recorded. Yet the innovation was not taken up. With more DFID-funding, the London School of Hygiene and Tropical Medicine took on the prolonged task of investigating the promotion of local manufacture, willingness to pay, the merits and limitations of social marketing, as well as technical matters. Anthropologists and economists joined the medical experts. Progress is now being made on uptake, twenty years after the original trials; and
- DFID supports a Bridging Research and Policy programme of the Overseas Development Institute and the Global Development Network to develop a better understanding of how research can contribute to pro-poor policies<sup>15</sup>.

45. DFID is promoting initiatives in developing countries to overcome these weak links. For example:

- Within the field of human health, we are supporting MIHR, a centre for the Management of Intellectual Property in Health, which seeks to build capacity in developing countries to negotiate access to intellectual property held within the private sector;
- The Participatory Plant Breeding Programme in Nepal involved local farmers in the research process from the start, setting the agenda of what should be researched—and yet generated findings that have wide relevance well beyond Nepal; and
- DFID-Bolivia is a key member of the donors’ consortium funding a new national system for agricultural research development and technology transfer. Research topics are identified by contracting users (eg producer associations) to list their priorities. These are then put out to tender to research suppliers—the users must contribute 15% of the costs.

46. In the transport infrastructure sector there have been successful DFID and collaborative research projects already completed in Cambodia and Vietnam on identifying sustainable access to rural communities to facilitate access to health, education, trade thereby creating opportunity for pro-poor growth and escape from poverty. The objectives of the South East Asia Community Access Programme SEACAP are that the optimal technology for the local circumstances is identified and includes local ownership of their access. This includes initiatives that allow roads to be constructed and maintained by

<sup>14</sup> OST, *Investment in Innovation*, paragraph 0.4.

<sup>15</sup> Annex 6.

local people using adapted local materials. Affordable in capital and recurrent costs, these rural road solutions have become the spine of local government policy and this programme is designed to expand the successes of the initial research work.

47. Dissemination efforts of work on science, technology and engineering is now becoming more focused on end-users, and on equipping the practitioners making decisions with best practice knowledge. The International Focus Group on rural road engineering is a good example of how local groups communicating with national groups which communicate with international groups facilitates a free-flow of knowledge backwards and forwards creating knowledge availability for use by government; the private sector or civil society groups in developing countries.

48. The new research strategy is looking at ways in which the Central Research Team could support country offices more in their efforts to promote research capacity in developing countries. The paper on this topic (available at <http://www.dfid.gov.uk/Pubs/files/research—country—study—draft1.pdf>) identifies a set of problems, of which the biggest is that research is systematically under-funded in many developing countries because the poor themselves, governments, and donors all have short time horizons. One proposal being considered for the new strategy would be for the Central Research Team to support particular country offices which are planning research capacity building support as part of their country strategy. The involvement of the Central Research Team could help maintain a long-term perspective. Implementers of DFID supported work in this area need to have robust links to country offices.

49. A current example of this is CRT collaboration with DFID-Bolivia in a programme to enable the new Bolivian national system for agricultural research development and technology transfer to access previous DFID-funded and international research.

*The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes*

50. Trade restrictions are a major problem for developing countries, and the UK has been in the forefront of negotiation at the World Trade Organisation (WTO) to overcome them. Much depends on international agreement rather than action by developing countries alone.

51. The UK has a major programme of trade-related capacity building in developing countries. DFID has committed £160 million to trade-related capacity building from 1998—more than treble the pledge in the 2000 White Paper. This Trade Related Capacity Building programme (TRCB) is about supporting the ability of developing countries to produce and implement a trade development strategy and then incorporating this strategy into their development or poverty reduction programmes. It includes action to:

- increase the volume and value of exports, including widening their range of exports and selling in a wider range of markets;
- increase foreign investment to generate jobs and trade through getting domestic firms to trade more and invest in trade-oriented industries; and
- participate in and benefit from the institutions of international trade, especially the WTO.

52. Details of the UK's Trade Related Capacity Building programme are given in Annex 7. It includes:

- training government officials to analyse trade issues, develop trade policy and negotiate internationally. This can also involve improving systems linked to trade, such as customs and excise;
- helping the private sector respond to opportunities arising from the multilateral trading system as well as coping with possible negative knock on effects; and
- making sure that trade policy takes into account the impact of trade on the lives of poor people.

53. These programmes contain elements of scientific, technological or engineering capacity

when that is reflected in the priorities of developing country partners. For example:

- Reducing pesticide residues in food—Compliance with EU social and environmental requirements, quite rightly driven by Western consumer awareness, present increasingly difficult demands on African producers that threaten the loss of valuable markets and could result in outgrowers and labourers sinking back into poverty. DFID-funded research in Kenya on the development of non-chemical methods of pest control is bringing together new partnerships between national research and regulatory authorities, and a commercial export company that wishes to spearhead the use of a wide range of indigenous bio-control agents. Initially, this initiative provides over 900 outgrowers access to improved production and application technologies developed by public-commercial investment and in future the whole industry can benefit from training packages that will be developed;
- A programme across southern Africa is looking at obstacles for poor producers which includes developing a common set of standards across goods throughout the region; and



- The UK is providing £17 million for a business linkages challenge fund. Its purpose is to encourage and support the formation of business links both between businesses in 20 developing countries across Africa, Asia, Latin America and with international partners. These links can enhance global competitiveness and generate clear benefits for the poor. It involves all stakeholders investing resources—skills, technology, information, facilities, supplies and access to markets.

54. Alongside the Trade Related Capacity Building programme, the UK also supports activities to help countries to make the most of longer term trading opportunities.

- Nearly three-quarters of trade development programmes since January 1998 assist small businesses and access to trade finance;
- DFID has invested £600 million since 1998 in programmes to improve roads, bridges and ports to meet the demands of moving goods to local markets and beyond to export markets; and programmes to make institutions and services work better, for example support to develop telecommunications and reform of stock markets;

55. There is good international co-ordination. Co-ordination with international programmes is an important element in ensuring targeted TRCB that meets developing country priorities and builds long-term capacity to understand and respond to trade issues in the international context. The UK is working with other donors in country, with the main TRCB agencies (WB, UNCTAD, WTO) and with the EC and OECD to promote a harmonised response. Details of the various joint programmes are provided in the Annex 7.

56. There is some coordination with NGOs. For example, DFID's partnership programme agreement with CARE covers a rural economic and agribusiness promotion programme. This links extension services, suppliers, outgrowers and agriprocessors with individual traders, or groups of farmers (sometimes organized into "farmer managed companies"), thereby reducing the transaction costs and enhancing the sustainability of linkages. We also fund a number of projects through the Intermediate Technology Development Group (ITDG), which works in a variety of ways to increase technical capacity. They work with communities to respond to challenges of new technologies, enabling communities to develop and adopt applications that improve their livelihoods. ITDG is a member of the International Network for Technical Information which provides an information service, and produces technical briefs with practical information on, for example, specific energy and manufacturing techniques.

The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced

57. The Private sector plays an essential role in generating new science and technology for developing countries. We directly engage with the private sector in a number of ways:

58. Our bilateral research funds (one of which is managed by a private sector company) contract research through open competition. The private sector is encouraged to apply for funding and a number of private sector organisations have secured research funding through this route.

59. We have supported the Consultative Group on International Agricultural Research to form partnerships with the private sector. For example, we are supporting the development of a livestock vaccine against East Coast Fever through a public/private partnership involving the International Livestock Research Institute and Merial.

60. Within human health, we have championed the use of public/private partnerships to develop new products and technologies. We are one of the most significant bilateral sources of funds to Public Private Partnerships for:

- The development of new Malaria treatments (Medicines for Malaria Venture—MMV). MMV is an independent not-for-profit entity that manages a portfolio of research to generate new treatments against Malaria. The private sector is estimated to contribute over 40% of total research costs;
- The development of new methods for the prevention of HIV/AIDS transmission that can be used by women (the International Partnership on Microbicides—IPM). In addition to reducing the transmission of HIV/AIDS, Microbicides have the potential of contraceptive benefits;
- The development of new vaccines against Malaria (The Global Alliance on Vaccines and Immunisations); and
- The development of new vaccines against HIV/Aids (the International Aids Vaccines Initiative).

Additional detail on these initiatives is in Annex 4.

61. *We are strengthening developing country capacity to make use of proprietary technology.*

62. We provide support to MIHR, a centre for the Management of Intellectual Property in Health, which seeks to build capacity in developing countries to negotiate access to intellectual property held within the private sector.

63. DFID, USAID and the Rockefeller Foundation also contributed to the design of the African Agriculture Technology Foundation, a public private partnership to support the licensing and distribution of new proprietary agricultural technology to poor African farmers.

64. DFID supports local research capacity building by promoting the inclusion of developing country research institutions in research programmes. Most research is carried out in partnership with developing country institutions and they lead on some projects. For example, the planning of sustainable regeneration of mining areas using tri-sector partnerships led by the Tata Energy Research Institute, India.

65. We believe there is an opportunity to do more with the private sector. A background paper for our research strategy is available at <http://www.dfid.gov.uk/Pubs/files/research—private—sector—1stdraft.pdf>. It considers various options for an expanded programme of collaboration with the private sector. The paper suggests three areas where DFID might strengthen private sector engagement in science and technology for developing countries:

- To establish a new financing mechanism to facilitate the development and transfer of proprietary technology;
- To strengthen the capacity in developing countries to regulate and licence new technologies; and
- To work more closely with other donors in order to broaden the base of public finance available to Public Private Partnerships.

66. We are currently exploring the potential for more public/private partnerships.

The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.

67. DFID's support for scientific and engineering training is mostly provided not in the UK but in developing countries themselves. Our support is mostly provided for the development of the education sector as a whole with the main focus on primary—the essential foundation for science and historically the most underfunded. DFID provided over £700 million to support education in developing countries in the period 1997–2002.

68. Within that, we have supported some innovative approaches, notably the Imfundo initiative to support the use of new technologies particularly in teacher training programmes in Africa. Imfundo links 40 partners from the private sector, civil society, global organisations and academic institutions. Further details can be found at [www.imfundo.org](http://www.imfundo.org).

69. *DFID funds three major programmes centrally that provide funds for training scholarships and the sharing of scientific and technical knowledge:*

70. The Commonwealth Scholarship and Fellowship Plan (CSFP) was established at the first conference of Commonwealth Education Ministers in 1959. DFID and the FCO currently support some 300–400 new awards each year, representing Britain's contribution to the Plan. Of these approximately a third are Fellowships, of three to six months duration. The remainder are postgraduate scholarships, of which about two thirds are for taught Masters degrees and the remainder doctorates. At any given time, there are about 600 award holders in the UK. DFID currently contributes £11.75 million annually, and the FCO £2.05 million (for students from Australia, Canada and New Zealand). This includes the introduction of scholarships by distance learning, the establishment of new Professional Fellowships, a programme of add-on events to develop the skills of award holders, and an expanded and more flexible split-site PhD programme. Approximately 55% of the current awards cover training in the natural sciences, and a further 29% in social science.

71. DFID support for the Shared Scholarship Scheme, administered by the Association of Commonwealth Universities, was introduced in 1986 (following the large increase in overseas student fees in the UK). Confined to developing Commonwealth countries, it aims to assist high quality students who wish to pursue studies relevant to development issues, but who could not otherwise afford to do so. Awards are mainly for postgraduate study. In 2001, 59 universities combined for a total of just under 300 bids. From the available DFID budget (£2 million per annum), it was possible to allocate 200 awards, of which 179 were subsequently taken up. Of the current 168 awards 53% are in science and technology.

72. The Higher Education Links Scheme (currently £3 million per year, but reducing to £2 million in 2004–05 and £1 million in 2005–06) supports linkages between universities in the UK and developing countries. The scheme has been running since 1981 and has funded over 3,200 links in a wide variety of areas. There are currently approximately 400 links in operation of which, including social sciences, approximately 85% could be categorised as scientific exchanges.

73. Other DFID Partnerships in science and technology include joining with other Whitehall Departments (DfES the FCO and the DTI) and other UK agencies (Universities UK, UKFEIT, Com Sec, ACU, NGOs), where appropriate, in discussion on Chevening Scholarships, and the role of Higher and Further Education in development. DFID is also represented on the Vocation Partnerships Board (DFES and The British Council), the Education and Training Board (British Council) and the International Working Group on Vocational Education and Training.

74. DFID's research programmes are focussed on research outcomes rather than training—but do sometimes include high-level training within the UK. This is particularly true in Health. Individual projects may also supply training to technical staff providing project support. This training may be necessary to appraise staff of novel scientific techniques.

75. Most of this training is used within developing countries. A tracer study following 844 developing country alumni of the Commonwealth Scholarship and Fellowship Plan, published in 2000, established that 95% of the respondees were employed in their home countries and making significant use of their skills and knowledge obtained in the UK. 93% rated their studies as having extremely or very useful benefits to their careers.

76. DFID believes that effective capacity building is usually best focused on institutions within developing countries. Support to an institution can give more impact, because it is more concentrated than scattered individuals. Examples of DFID support to institutions include:

- A £6 million contribution towards the development of courses in the distance-learning University of South Africa;
- London School of Hygiene and Tropical Medicine support over 12 years for a national institute for health in Mwanza, Tanzania, including training lab staff and facilitating access to other donors;
- Support (from Reading University) to build the capacity of local consultancy firms in Malawi to analyse food security issues; and
- Support for the Kigali Institute of Science and Technology in Rwanda to set up a regional training centre for computer technicians and a Centre for Intermediate Technology Training in partnership with ITDG in the UK.

*November 2003*

## **Annex 1**

### **THE MILLENNIUM DEVELOPMENT GOALS**

- Halving the proportion of people in extreme poverty and suffering hunger between 1990 and 2015;
- Achieving universal primary education by 2015;
- Eliminating gender disparity in education by 2015;
- Reducing by two thirds, between 1990 and 2015, the under-five child mortality ratio;
- Reducing by three quarters, between 1990 and 2015, the maternal mortality ratio;
- Halting and beginning to reverse the spread of HIV/AIDS and the incidence of malaria and other major diseases by 2015;
- Ensuring environmental stability; and
- A global partnership for development.

## **Annex 2**

DFID's current position on the "C" Recommendations of the Cross cutting Review of Science and Research, 14 November 2003

### *Recommendation C1*

Departments to cost S&I strategies.

- DFID will produce a new research strategy by March 2004 which will contain projected research spending for the rest of the SR period.

### *Recommendation C2*

Departments to identify research component in SR bids to Treasury, and to agree research budgets with Treasury, in consultation with OST, before issue of settlement letters.

- DFID's current research spending plans reflect the expectation that levels will match those of SR2000 in real terms.

*Recommendation C3*

Departments to ensure that future costings fully take account of cost implications of Transparency Review, for any contracts they intend to place with HEIs.

- DFID includes recognition of the need for universities to charge the full economic cost of research activities in its value for money considerations and its overall research budgeting.

*Recommendation C4*

Departments not to transfer resources from, or fall below, the agreed R&D allocation as set out in the settlement letters without seeking permission from the Chief Secretary to the Treasury, in consultation with the Government's CSA.

- DFID has noted this requirement.

*Recommendation C5*

Departments conducting appreciable amount of research to have CSA.

- DFID now has a new senior post of Head of Research. CSA arrangements are being reviewed in light of this and the restructuring of Policy Division. We will want to ensure that any arrangements give full weight to the importance of science in our policy and research work.

*Recommendation C6*

GCSA should be involved in appointment of departmental CSAs.

- OST was involved in the recruitment of the new Head of Research and GCSA will be involved in the selection process for at least one member of the proposed Research Advisory Board.

*Recommendation C7*

DCSAs to be accountable to Ministers and departmental top-level board for level of scientific expertise in the department.

- Chief Professional Advisers are accountable to Ministers and the Management Board for the level of scientific expertise in the Department.

*Recommendation C8*

DCSAs to work with departmental personnel function to review and categorise posts in terms of requirements for scientific expertise. Departments to maintain records on specialist staff in order to identify scientific qualifications and experience.

- DFID introduced a new human resources system, "Yourself", in April 2003 which includes data on scientific qualifications and experience of all staff.

*Recommendation C9*

DCSAs across Whitehall to ensure that professional staff engaged in research management undertake professional development and are exposed to latest science in their work.

- DFID Chief Professional Advisers and the Head of Central Research will be responsible for ensuring appropriate professional development is undertaken by staff engaged in research management. DFID will promote secondments and exchanges of staff with scientific expertise to other appropriate government departments, and national and international research institutions as part of its overall policy on staff exchanges.

*Recommendation C10*

DCSAs to work together, and with GCSA, to ensure that opportunities and resources for career progression for scientists are available across the civil service wherever appropriate.

- See response to Recommendation 9.

*Recommendation C11*

Departments to ensure knowledge transfer objectives are included in S&I strategies and research programmes. Senior official to be nominated as responsible for delivery of Baker agenda.

- To help meet its PSA Objectives DFID will promote take up of the innovative approaches and research findings it develops. The new research strategy highlights the importance of, and increased resources for, knowledge transfer as well as generation. The Head of the Central Research Team will be responsible for delivery of the Baker agenda.

*Recommendation C12*

Departments to ensure their PSREs have in place framework for commercial exploitation.

- DFID has no PSREs but its contractual arrangements with institutions implementing DFID-funded research are in line with the principles on knowledge transfer, IPR, commercialisation and work with the private sector recommended by Baker.

*Recommendation C13*

PSRE Fund should be continued in SR2002.

- N/A

*Recommendation C14*

DCSAs to be consulted when departments undertake major policy reviews.

- Chief Professional Advisers will play an important role in major policy reviews.

*Recommendation C15*

GCSA should explore scope for increased use of merged research budgets in cross-cutting areas of research.

- The International Development Act 2002 prevents spending for which the primary purpose is not the reduction of poverty. This limits the scope for DFID involvement in merged-budget research initiatives.

*Recommendation C16*

Departments to ensure arrangements for funding of basic research are sufficiently co-ordinated to ensure their future research needs continue to be met.

- DFID's development assistance is untied. It funds relatively little basic research. In preparation of its new research strategy DFID will consider how best to support capacity building in developing countries to acquire, use and generate knowledge. The new research strategy is currently considering capacity building issues.

*Recommendation C17*

GCSA to be responsible for rolling programme of review of science in government departments.

- Noted.

*Recommendation C18*

Progress of review programme to be assessed in four to five years' time.

- Noted.

**Annex 3****EXAMPLES OF RESEARCH IMPACT**

Work under current research programmes has contributed significantly to knowledge and practice for poverty reduction. For example:

International agricultural research network: DFID contributions to the funding of the international agricultural research network have helped to support the development of new maize varieties, which contain nearly twice as much protein as conventional plants and are nearly 10% higher yielding. These maize varieties, created through conventional breeding techniques, are now grown on more than one million hectares worldwide, helping to provide a more balanced diet for people who eat maize as a staple food;

Communicable diseases: DFID funded work on key communicable diseases showed how large numbers of cases of HIV and TB could be averted. The project provided the basis for the WHO strategic framework for reducing the burden of TB/HIV, which is planned for implementation in eight of the most affected countries in Southern and East Africa;

“Young Lives Project”: A consortium of academic institutions and save the Children is investigating the changing nature of childhood poverty in Vietnam, Peru, Ethiopia and India. Initial surveys, covering 12,000 children in 80 communities, have just been completed. Governments are already showing strong interest in the research findings and in integrating specific needs of the young into development strategies;

Infrastructure: DFID-funded researchers in Cambodia and Vietnam developed an innovative solution to the problem of building low-cost and durable roads using only locally available materials. Bricks were made from local clay, fired using rice husk for fuel, and local labour was employed to set and maintain the new roads. This initiative is now being copied throughout Vietnam and provides previously inaccessible rural communities with access to economic opportunities including markets alongside access to health and education;

Wastewater treatment: Work on waste stabilisation ponds in Colombia and Mexico improved their safety and the availability of the effluent as irrigation water for crops. The design and testing of fibre cement panels as channel dividers helped to cut down the effects of wind on open ponds. Their use of channel dividers has now become standard practice in many parts of the world;

Diversity in education: Studies on diversity in education in South Africa and India have provided advice to government and the Human Rights Commission on disability, and on inclusion and exclusion from education systems in these two countries.

## REGIONAL

Rwanda: Support for the Kigali Institute of Science and Technology to develop its capacity in IT and IT engineering; plus support for a Centre for Intermediate Technology Transfer working with the Intermediate Technology Development Group in the United Kingdom.

Ethiopia: DFID supported (with the Imfundo team) a cost benefit analysis of a multi-media distance education training programme for secondary schools in Ethiopia.

## INSTITUTIONAL UK

DFID provided support to the interactive exhibition, Climate Change: The Burning Issue, which ran from March to September 2002. It demonstrated what is being done to model, measure and manage the effects and implications of climate change. The exhibition included displays on the potential implications for developing countries and what researchers and communities are doing not only to reduce emissions but also to cope with the changing climate.

DFID also supported a Schools Initiative for the exhibition in conjunction with six UK schools. After an initial visit to the exhibition at the Museum, groups linked up with partner institutions in the developing world to broaden debate around issue of climate change and sustainable development and formulate four key questions that they, in partnership with their link school, would like to pose to a panel of “expert”/“key players”. These were put to panellists, including the DFID PUSS, in a Question Time style panel discussion held in February 2003.

**Annex 4**

## HEALTH

### KNOWLEDGE PROGRAMMES

1. A large proportion of our health funding is to support long-term research platforms (knowledge programmes) that build critical capacity in both the UK and overseas in priority and under-resourced areas. These multi-year programmes are competitively tendered around broad research agendas. Examples include health economics, health systems research, reproductive and maternal health. The funding of these programmes levers additional resources to the agreed programme objectives. Together with DFID health advisers a series of knowledge programme outputs are agreed. DFID kept a close relationship with these programmes, and through this relationship, DFID’s health advisers in the UK and in overseas offices are kept up to date and at the cutting edge of research in critical areas.

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### *Public Private Partnerships*

#### 2. IAVI (International Aids Vaccine Initiative)

Funded by a consortium of donors, including the USA, Canada, the Netherlands and Ireland with UK as one of the founding funding partners, IAVI has the objective to accelerate the development of a safe, effective and affordable HIV vaccine for the developing world. IAVI identifies promising candidate vaccines and through a process of North South partnership accelerates field-testing in the developing world. Several phase I and II vaccine trials are underway. The first phase III trial is a collaboration between Oxford and Tanzanian researchers. A feature of IAVI is the very strong relationship with communities in developing country field sites. As a result IAVI has established one of the strongest systems for genuine informed consent in such countries. Another unique feature is the ability of IAVI to carry much of the ethical risk in testing vaccines that may not make it to commercial production for reasons of low vaccine efficacy. However this research is vital as it helps map out new and promising research avenues for the future. This is an area that the commercial sector alone would not contemplate for both commercial and legal/ethical reasons. IAVI has brought significant additional resources and innovative approaches to HIV vaccine development. More is needed.

#### 3. IPM (International Partnership on Microbicides)

Taking a similar approach, IPM is an international partnership of public and private researchers that aims to developed effective vaginal microbicides against HIV. A simple self inserted and female controlled technology could prevent HIV infection by killing or rendering ineffective the AIDS virus. Microbicides also have the potential of contraceptive benefits. It is accepted that this product is never likely to develop into a highly profitable product—the market is too small, and prices have to be kept low in order to benefit developing country populations. Consequently it is largely in the public sector that research is being undertaken. Whilst having some potentially effective and innovative products in the pipeline, profit margins and public sector capacity is insufficient to field test and bring such products to market. The aim of the IPM is to meet this gap. IPM is funded by a consortium of donors and brings separate and competitive public researchers together into a single partnership. MRC (DFID funding) and NIH (US) are the big players.

### THE GHANA VITAMIN A STUDY

4. Together with WHO and USAID, DFID funded a long-term randomised control trial of Vitamin A supplementation in children. This study built significant research capacity in Ghana where the study took place. Conducted in partnership with the London School of Hygiene and Tropical medicine it demonstrated where and how Vitamin A supplementation impacted on child survival with major lessons for future programme design and the safe delivery of Vitamin A

### THE MWANZA STUDY ON SEXUALLY TRANSMITTED INFECTIONS

5. This major randomised control trial, funded by DFID, demonstrated the important impact of preventing Sexually Transmitted Infections (STI's) on future HIV transmission. By treating STI's individuals were rendered significantly less susceptible to HIV infection after treatment. This has had major implications for HIV prevention programmes, and has generated further research to better understand this relationship in different environments and areas of differing HIV epidemic and disease burden.

### *Maternal Mortality*

6. DFID has funded work with Professor Wendy Graham (now at Aberdeen) to develop innovative ways to measure maternal mortality. The development of the sisterhood methodology to indirectly and relatively cheaply assess maternal mortality in developing countries where such data is not available is internationally recognised for its quality and innovation. The method is now widely used. Professor Graham now leads a team that, with Gates Foundation and DFID support, has developed into one of the world's leading centres for assessing the effectiveness of interventions to tackle maternal mortality and morbidity.

### THE COCHRANE COLLABORATION: EFFECTIVE HEALTH CARE ALLIANCE PROGRAMME

7. DFID was a major funder of this innovative review of existing literature on the effectiveness of public health interventions. Revisiting existing literature, obtaining unpublished studies and assessing only on the basis of well designed trials, this centre's work has often fundamentally challenged current policies and builds an increasingly powerful base for evidence based policy making. It has also shown how much so-called "new research" is no more than repeating existing work, or adding no new knowledge. This collaboration probably represents some of the most powerful work that DFID funds in terms of direct policy impact. A table of examples is laid out below

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**IMPORTANT RECENT SYSTEMATIC REVIEWS (PUBLISHED OR DUE TO BE PUBLISHED)**


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	<i>Review Topic</i>	<i>Findings</i>	<i>Implications and impact</i>
Diarrhoea	Reduced osmolarity oral rehydration salt solution vs WHO standard.	Reduced osmolarity solution associated with fewer IV lines and less vomiting.	WHO-UNICEF changed recommended formula for ORS solution.
Malaria	Routine Anticonvulsants for cerebral malaria.	Barbiturates associated with fewer convulsions but higher death rate.	Do not use barbiturates routinely.
	Artemether-lumefantrine for uncomplicated malaria.	4-dose regimen generally inferior to standard treatments; 6-dose regimen little researched.	Shift to co-artem by national governments in some African countries premature.
	Amodiaquine: adverse events	No convincing evidence that amodiaquine is associated with an excess of adverse events.	Amodiaquine returned to the WHO Essential Drugs list.
	Artesunate combination treatment (individual patient data analysis)	Adding three days of artesunate to existing first line treatment regimens results in dramatically improved cure rates.	Although findings not yet published, already widely disseminated through WHO to drive policy discussions.
TB	Directly observed therapy	With six trials now published, current evidence suggests the specific strategy of direct observation produces cure/ treatment completion rates similar to self-treatment at home.	Some suggestion WHO is now interpreting “directly observed therapy” more flexibly, for example, it can now include self-treatment at home.
HIV	Circumcision to prevent transmission	No RCTs; observational studies highly confounded; no good evidence that circumcision is effective.	Some evidence of a slow down in some donor’s enthusiasm for circumcision as an intervention.
Organisation of care	Integration of primary care	Integration of primary health care services is more complicated than often considered. It can be associated with better quality, but may actually cause quality to decline.	Blueprint approach to lumping all reproductive and MCH services together at the point of delivery probably inadvisable until clear evidence of benefit demonstrated.

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**Annex 5**

**BRITISH NATIONAL SPACE CENTRE (BNSC) (DTI) EVIDENCE TO THE HOUSE OF COMMONS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY**

“THE USE OF SCIENCE IN UK INTERNATIONAL DEVELOPMENT POLICY”

British National Space Centre, BNSC is engaging proactively with other UK Government Departments through its Government Information From The Space Sector (GIFTSS) programme to better coordinate operational information needs with space capabilities and promote increased partnership across Government. Increased engagement with DFID in this area is seen as important and potentially beneficial to both sides in promoting the uptake of space-derived information for UK and overseas development, including Geographical Information Systems, Remote Sensing and early-warning systems for disaster preparedness.

The UK, through BNSC, is helping to enable emergent and developing nations to invest more affordably in space related capacity development, to realise tangible development benefits and become partners and stakeholders in addressing the digital divide. The Disaster Monitoring Constellation (DMC) is an international project led by Surrey Satellite Technology Ltd. (SSTL) involving Algeria, China, Nigeria, Thailand, Turkey, Vietnam and the UK. DMC offers a unique approach that will enable daily revisit monitoring of rapidly-changing phenomena worldwide. Five per cent of the processed images from the DMC will be available for distribution to relief teams via the Reuters AlterNet programme. DMC is a component of the UK MOSAIC (Micro Satellite Applications in Collaboration) programme funded by DTI.



DFID is an authorised user of the International Charter on Space and Major Disasters. The Charter aims at providing a unified system of space data acquisition and delivery to those affected by natural or man-made disasters through authorized users, normally in the areas of civil protection and emergency relief aid. Consequently DFID can activate particular space based services for crisis response within this framework as and when required. BNSC is the principal UK point of contact for the Charter and provides a supporting infrastructure for this activity. DFID most recently activated the Charter during the eruption of the Soufriere Hills volcano on Montserrat in July 2003. The DMC mission may have the capability to offer products and services to the Charter in the near future.

1. A number of international initiatives are already in place to promote knowledge transfer, capacity building and the integration of Earth Observation (EO) and other space information in the interests of sustainable development, crisis response and good governance for improved planetary management. G8 countries are represented here to different degrees. A number of these initiatives were presented at the World Summit on Sustainable Development (WSSD) at Johannesburg in August 2002. These included the EU Global Monitoring for Environment and Security (GMES) Programme, The Committee on Earth Observation Satellites (CEOS), The International Global Observing Strategy Partners (IGOS-P) and the International Charter for Space and Major Disasters.

2. More recently, and linked to the recent release of a new US Policy on EO data use, the Bush Administration hosted an Earth Observation Summit (EOS) in Washington DC on 31 July 2003. The UK participated in the summit through the British National Space Centre (BNSC) and DEFRA. This high level event was aimed at generating support from the international community by bringing together senior international government and non-governmental leaders in climate science, technology and the environment to strengthen the focus on global Earth observation—primarily with a focus on climate change issues in preparation for the Ninth Conference of the Parties to the UN Framework Convention on Climate Change in December 2003. The summit agreed a Declaration, which affirmed the need for timely, quality, long-term, global information as a basis for sound decision making and established an Ad-Hoc Group on Earth Observations (GEO). The GEO has established a work plan for the next 12 months and a final Implementation Plan is to go to a European EO Summit late in 2004.

3. The UK, through the partners in BNSC, and the private sector is an active participant in advising, and assisting these initiatives to realise practical benefits where appropriate (Annex 1, paragraphs 1 to 8 provide additional background).

4. DFID have recognised the need for stronger integration of their research effort with other funders, research activities and international collaborations in the objective of their new research strategy within the DFID Public Service Agreement goal “to develop evidence based, innovative approaches to development”.

5. Consequently, the priorities of these centres of excellence will be closely linked to national and regional planning processes for sustainable development (including Poverty Reduction Strategies, National Strategies for Sustainable Development and the New Partnership for Africa’s Development—NEPAD). Detailed proposals for developing networked multidisciplinary centres of excellence in African partner Universities to address technological needs and opportunities and country specific assessments of technological priorities (both in terms of needs and opportunities) are to be developed by the end of 2004. These will be based on a participative process, which will engage academic, government, business, and civil society stakeholders. The Royal Institute of International Affairs (Chatham House) is developing proposal to take this further forward (Annex 1, paragraphs 9 to 11 provide additional background).

**Annex 5a**

## ADDITIONAL BACKGROUND

### BNSC

BNSC is a partnership formed from 10 Government Departments and Research Councils to coordinate UK civil space activity. BNSC is committed to putting space to work for the benefit of all citizens, and aims to get the most scientific and economic value out of its activities in space. UK’s civil space policy focuses strongly on cost-effectiveness in space programmes and investment is largely in areas with the greatest commercial potential, such as Earth observation, satellite communication and navigation. (<http://www.bnsc.gov.uk/>)

1. BNSC seeks to maximise the exploitation of related investments in the development and use of space being made across HMG—in PPARC, NERC, the Met Office, MOD, DfT and DEFRA as well as DTI—and by the European Commission and European Space Agency. DTI space investment is squarely focused on maximising UK economic benefit from the applications of space and will ensure that European space infrastructure and targeted applications are developed and exploited to the advantage of the UK economy as well as in support of scientific research.

DTI plays an essential underpinning role in innovation within the BNSC Partnership so that the UK maintains an industrial capability that is both innovative and competitive—and focused on developing applications, services and infrastructure that meet future market needs. The DTI leads in Government on measures to increase overall prosperity by capturing these benefits across many sectors of the economy. The space sector is a breeding ground for cutting edge research, innovation and development of skills that underpin the knowledge economy. Space is a highly international market and a significant proportion of operational delivery of UK's objectives is achieved through international partnership with Europe and as part of bilateral arrangements, increasingly with Developing Countries.

2. For the future, space infrastructure is increasingly being recognised as an essential part of the strategic infrastructure that will assist the world in dealing with sustainable development, peacekeeping and humanitarian aid and other major socio-economic issues at the global scale.<sup>16</sup> A number of international initiatives are in place to promote coordination of Earth Observation (EO) and other space assets in support of sustainable development.

3. It is recognised internationally that the provision of R&T and research infrastructures through national and international space agencies will be insufficient to meet these broader global needs. Organisations such as the World Bank are active in the debate as to what infrastructure and services are important for the future and how these should be financed. Should these debates be successful, this could substantially change the future markets for space and consequently opportunities for a wide cross section of UK government, research organisations and the private sector.

4. Many practical uses of space based systems, particularly Earth observation (EO), are currently available. More effective service offerings can be expected from a more fully integrated suite of space assets and space system research and development. This improved coordination will better support applications that meet information needs in sustainable development, crisis response and good governance in line with achieving UN Millennium Development Goals, particularly MDG seven and eight.<sup>17</sup>

5. The UK is particularly strong in scientific research and operational capabilities (in Government and private sector services) related to all areas of environmental monitoring and management.

6. Coordination of respective EO strategies and other space activities and participation in international activities to promote coherence between existing initiatives will become increasingly important in supporting sustainable development globally.

## CETISA

7. The overall coordination of the CETISA partnership will be provided by the Sustainable Development Programme of the Royal Institute of International Affairs (RIIA) in close consultation with the soon to be established NEPAD Commission on Science and Technology. In addition, the partnership will seek to work with, and (where appropriate) build on, work done by existing technology-related partnerships and initiatives in Africa, in particular the work being done by the Southern African Research and Innovation Management Association (SARIMA). Relevant UN and Bretton Woods organizations will be invited to participate in the partnership's activities.

8. During the design phase, RIIA will aim to pass on the facilitation and management of specific work streams to other organisations with relevant expertise. The entire CETISA process will be strongly participatory, and its outcomes will largely be determined by priorities of the African partners. CETISA will also seek to work closely with ongoing sustainable development processes at the national level, including National Strategies for Sustainable Development and Poverty Reduction strategies.

9. RIIA will take the process of developing the proposals for the Centres of Excellence forward through a series of three workshops, bringing together leading experts on science, technological innovation and sustainable development from Africa and the rest of the world. The outcome will be detailed proposals for the establishment of regional centres of excellence on freshwater and energy—two sectoral priorities that have been highlighted both by NEPAD and by the intergovernmental agreements made at WSSD. Working with partners, a full proposal for the design phase of the partnership will be submitted to the Finnish and UK governments, to the European Union's Framework VI R&D Programme, and to other donors with an interest in building capacity in African Universities.

30 October 2003

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<sup>16</sup> OECD (2003) OECD Futures Project—The Commercialisation of Space and the Development of Space Infrastructure, The Role of Public and Private Sectors. Second Steering Group Meeting, Paris, 17 October 2003.

<sup>17</sup> MDG 7—Ensure environmental sustainability, MDG 8—Develop a global partnership for development (<http://www.un.org/millenniumgoals>)

### PUTTING RESEARCH INTO POLICY EFFECT

DFID supports a Bridging Research and Policy programme of the Overseas Development Institute and the Global Development Network to develop a better understanding of how research can contribute to pro-poor policies, and systems to put it into practice.

A literature review published in 1999 identified theoretical approaches in political science, sociology, anthropology, international relations and management, and provided a 21-point checklist of what makes policies happen. In 2002, ODI developed a new Framework for understanding research-policy links. It tested and used it to analyse four policy events: the adoption of PRSPs by the World Bank in 1999; the development and adoption of an ethical charter by humanitarian agencies since 1997; animal health policies in Kenya since 1985 and the incorporation of the Sustainable Livelihoods Approach within the DFID White Paper in 1997. ODI also coordinated the collection and analysis of 50 short case studies based on existing knowledge about research-policy links for the Global Development Network “Bridging Research and Policy Project”, and has undertaken a wide range of advisory and consultancy work on these topics.

The traditional question “How can research be transported from the research to the policy sphere?” has been replaced by a more complex question: “Why are some of the ideas that circulate in the research/policy networks picked up and acted on, while others are ignored and disappear?”.

Emerging results from ODI’s work indicate that research is more likely to contribute to evidence-based policy if:

- i. it fits within the political and institutional limits and pressures of policy makers, and resonates with their ideological assumptions, or sufficient pressure is exerted to challenge those limits;
- ii. the evidence is credible and convincing, provides practical solutions to current policy problems, and is packaged to attract policy-makers’ interest;
- iii. researchers and policy makers share common networks, trust each other, honestly and openly represent the interests of all stakeholders and communicate effectively.

But these three conditions are rarely met in practice, and although researchers can control the credibility of their evidence and ensure they interact with and communicate well with policy makers, they often have limited capacity to influence the political context within which they work, especially in less democratic countries. Resources are also limited, and researchers need to make choices about what they do.

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## APPENDIX 2

### Memorandum from NIAB

Originally Government Grant-Aided but privatised in 1996, NIAB is a research organisation with interests in the improvement of agricultural production, especially of food crops. We are used to operating at the private/public sector interface and at the point at which science is translated into usable technology. I am writing as NIAB’s Director of Crop Performance and Improvement and Deputy CEO. I have been responsible for NIAB’s international consultancy programme over the last 14 years.

In seeking to achieve the UK Government’s target for poverty alleviation, we believe that a more innovative approach is needed to technology transfer. There is substantive anecdotal evidence that the cost-benefit equation for research spending would be radically improved if the efficiency and completeness of the transfer process could be enhanced.

Published research on the subject of technology transfer and innovation diffusion is voluminous but somewhat repetitive. One avenue that has been little explored is to adapt private sector thinking to the problem, in particular to treat alternative vectors of technology transfer as brands that can be managed in the marketplace for information. NIAB has undertaken research to explore such an approach initially in collaboration with the Judge Institute of Management Studies, Cambridge University. We have also recently completed a Government-funded (DFID) pilot study of ways of improving the efficiency of technology transfer through the application of brand theory to vectors used in two major projects in India. Both projects are focussed in areas of rural poverty, the Western India project in particular seeks to help people with extremely low incomes.

We would like to recommend that the UK Government should further support and encourage the use of such business-focussed methodologies to achieve better delivery to target end-users. We believe that the “development world” is rather separate from the business and marketing communities and that better interplay offers great potential value. Such thinking is common in network theory that emphasises the “strength of weak ties” for quantum step advance.

July 2003

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**APPENDIX 3****Memorandum from Dr R T Patterson**

On 21 July 2003, the United Kingdom Parliament called for written evidence from interested parties on the use of science, technology and engineering in UK international policy development. I was involved in a scientific capacity in the overseas delivery of the British Foreign Aid programme over a period of almost 30 years. I served the Overseas Development Administration (ODA) under OSAS terms in Zambia from 1972 to 1975, as a TCO in Bolivia from 1976 to 1984 and as a resident project manager for the Livestock Production Programme (LPP) in Kenya from 1994 to 1996. I then served the successor to ODA, the Department for International Development (DFID) as a UK-based project manager, conducting a research programme for the Livestock Production Programme (LPP) in Bolivia, from 1996 to 2001. I therefore feel that my long and varied experience has placed me in a position to make the following comments. I realise that they will not directly address the terms of reference of the inquiry, but I believe that they are relevant to the general subject under consideration. I am passionate about the provision of practical, scientific assistance to poor people in the developing world and believe that it is possible to make the British efforts more meaningful and efficient. I hope that you will take my opinions into account in the same positive sense in which I offer them.

**CHANGING PROFESSIONAL FASHIONS**

In the 1970s, most of the ODA activities in agriculture in the developing world were to do with the generation of appropriate technology. Towards the end of that decade and into the next one, ODA started to claim that there was sufficient technology already available, which was not being fully utilised. Increasing emphasis was then placed on social aspects, firstly in terms of agricultural economics and the Farming Systems Approach, and later, in sociology. By the 1990s, anthropology had become an important field of study. Over this whole period, a reducing amount of attention was placed on the technological aspects of foreign aid. Recently, the DFID programme has been dominated by policy, including numerous “buzz-words” such as market awareness, gender issues, good governance, poverty elimination and sustainable livelihoods. As this change has proceeded, there has been less and less emphasis on the technical and scientific aspects of the real problems facing poor farmers and livestock keepers in the developing world. This has been accompanied by a corresponding increase in the academic aspects of the social sciences, where most work has been aimed at policy and decision makers in the capital cities of the third world. While it may be true that the technological work conducted in previous decades was hampered by a lack of sociological input, the pendulum has swung too far and the generation of appropriate new technology is now largely being ignored by DFID.

At the grass-roots level, there are many millions of poor people in developing countries who operate at, or very close to the level of subsistence farming. For them, the modern, fashionable social considerations make little difference to the amount of food that the family can produce for their own consumption, but the implementation of improved agricultural and animal husbandry practices could make a substantial difference to their standard of nutrition. It must be admitted that there are cases where technology developed by aid agencies has not been taken up by subsistence farmers, even when it appears to offer them substantial benefits. Generally speaking, when this happened, there were problems with the technology that were not appreciated by the developers. This does not necessarily mean that the technology was wrong, but it might be that there were aspects of the situation that were not properly identified before the research took place. As an example of this, in the 1970s, poor farmers in Zambia refused to grow the high-yielding peanut variety “Makulu Red” because it had a red coloured skin and they preferred their traditional brown-skinned varieties, even if they produced lower yields. Similarly, more recently in East Africa, starving people were reluctant to accept food aid of white maize, because they were used to yellow maize and believed the white varieties could cause male sterility. These failings should not be used to argue that there is no need for more, or better technological solutions to real problems. There is always a need for better technology, but in recent decades, this has been ignored by the policy-makers in the aid organisations, including DFID, in favour of more social studies which make little direct contribution to the poorest people of the world.

*Expertise*

In the 1970s, largely as a result of experience gained in the Foreign and Colonial Office (FCO), Britain could boast of having the largest and most competent body of tropical agricultural specialists in the world. As many ex-colonies were given their independence in the period from the late 1960s to the mid 1970s, many trained expatriate research and extension staff lost their jobs in the newly emerging countries. Some of these experts returned to the UK, often to teaching positions, but many more emigrated permanently to countries such as Australia, or South Africa, where, although lost to the developing world, they made huge contributions to agriculture in their new homelands. With the demise of the Colonial Service, a number of British scientists with experience in the tropics sought to continue their research and development work in less developed countries, by joining ODA, one of the international CG centres, or the United Nations. In the 1980s, the British Government spoke frequently of establishing a career structure to permanently accommodate some of these specialists within the aid programme, but little was done except to offer a few

of them extended, 10 year contracts within the ODA Corps of Specialists. Most foreign aid workers had to be content with short term, two or three year contracts within the TC programme of ODA. As time went on, the number of scientists prepared to base a career on the uncertainty of such a system of contracts decreased. The result of this has been that many good young scientists spend one or two contracts overseas, gaining valuable experience, but then return to establish themselves in permanent positions in Europe or the UK. This has led to a continual reduction in the available pool of foreign experience, as the British staff with long-term expertise, developed in the FCO, reached retirement age and were not replaced by younger people who were prepared, or were not able, to spend their working lives in the service of the developing world.

Even the best theoretical education, coupled with the necessary altruistic attitude, is no substitute for years of hard-earned, practical experience in the developing world. Because of a lack of experienced personnel, it has now reached the stage where staff on their second two or three year overseas contract are placed in senior positions, before they have obtained the level of experience necessary to successfully carry out their duties. This is reflected in the standard of the decision-making seen both in DFID projects and in regional offices. Many staff in DFID headquarters in London have very limited residential experience in developing countries and as a result of this, an incomplete understanding of the problems faced by the poorest people in target countries. Lack of in-country experience has led to a failure to recognise the wide differences in perceptions and attitudes of the inhabitants of developing countries in different continents. Given this situation, it is no surprise that politicians in the developing world are able to obtain agreement for British funding for projects that would have been rejected by more experienced DFID personnel. This results in the inefficient use of funds and the loss of the international prestige that the UK used to enjoy, because of its well-directed and effective foreign aid programme.

### *Project Management*

In parallel with the reduction in British staff with long-term, hands-on experience in the developing world, there has been an increase in the management of overseas research projects from UK-based institutes, through a series of occasional visits. It has been argued that there are now trained research and extension staff in most developing countries and all that is needed for the programmes to achieve their objectives is to provide funding and occasional guidance. This approach fails to appreciate the pressures that are brought to bear on young national professionals to allow British funds and equipment to be used for purposes for which they were not intended. Even in cases where there is no question of corruption, such practices can have a major, negative effect on the agreed programme of work, which cannot be corrected by management at a distance.

It now appears that there is a school of thought within DFID, suggesting that from 2005, only funding should be provided, either to recipient government departments, or direct to their treasuries, so that they can commission their own research and development on the open world market. Because of high costs, British institutions cannot compete with similar entities in emerging countries such as India and Cuba, so this change of approach would lead to the total demise of British expertise in tropical agriculture. It would also fail to provide safeguards to ensure that the foreign aid budget, funded by the tax-payer, would be properly spent and accounted for. Anyone with experience in the developing world knows that an appreciable proportion of the foreign aid budget is already being filtered off through corruption. The situation will get worse if British staff are not present in the field, to exercise some measure of control over the use of British funds.

### *Priorities*

The present priorities of DFID appear to be somewhat confused. Clearly, poor people have many needs that must be addressed and education and health, for example, are of great importance. It should be said, however, that starving children cannot concentrate sufficiently to absorb knowledge in schools, while many health problems are aggravated by inadequate nutrition. In recent years, there appears to be a reduction in the proportion of the aid budget that is destined for agriculture, a situation that flies in the face of the reality of the poorest of the developing countries.

It is said that the aid programme should be aimed at the elimination of poverty and few would argue that this is not a highly laudible objective. It is, however, somewhat impractical, particularly when DFID is extremely reluctant to define exactly what it means by poverty. Nevertheless, a significant amount of aid money is being spent on "high-tech" activities. In Bolivia, an LPP project has been developing a computerised decision support system to assist small-scale dairy farmers. This kind of work ignores the fact that the poorest people cannot afford to keep dairy cows, or to have access to such basic services as electricity and safe drinking water. It will be many decades before such people can aspire to owning the computer necessary to make full use of a decision support system.

Under the present procedure in the DFID Research Programmes, calls are issued and research entities and individuals then submit bids for funding to address the stated criteria. Frequently, the calls are somewhat nebulous and are intended to fill gaps in a programme logical framework designed in London, rather than to tackle specific problems encountered in well-defined areas of the real world. The bids are then

considered by a project evaluation committee and some are approved for funding. When the call is wide-ranging and is intended to cover several disparate target countries, it must be an extremely difficult task to select the best proposal from amongst several that are not really comparable. In such a situation, it is not surprising that the chosen projects often appear to be based on the personal preferences of the advisers who sit on the committee, rather than on the actual needs of the target groups. This will continue until technically experienced DFID staff in the target countries are able to define with clarity, the priority problems that need to be addressed in particular areas and for the benefit of a particular target group.

Finally, for well known historical reasons, DFID aid is heavily biased towards developing countries in Africa, where about 60% of the budget is spent. Experience suggests that in many places, decades of assistance has produced a large measure of aid dependance where governments are reluctant to take steps to help their own populations, since they feel, with some justification, that foreign aid will step in to fill the void. One of the basic precepts of any successful aid programme must be that foreign staff aim to eventually work themselves out of a job by training their counterpart staff to a standard where they can replace the expatriate. Attempts to do this have been more successful and much less aid dependancy has been created in South America and the Indian sub-continent than can be seen in most countries in Africa. Given the distinct lack of long-term, positive results obtained in most African countries, it is my belief that apart from emergency aid, the scientific programmes should be scaled down in that continent and reinforced elsewhere where the culture is more likely to accept that foreign assistance should be transitory, rather than permanent.

### *Conclusions*

It is my belief that the aid programme of DFID has many failings that need to be addressed if it is to continue to make relevant contributions to the poorest people in the developing world. Amongst the steps that should be taken are the following:

- Increase the number of staff with wide in-country experience in positions of authority within DFID;
- Return to the times when most aid staff resided in the developing world. This would require the development of a career structure to attract long-term professional staff;
- Restore the importance of agriculture and food production within DFID programmes;
- Set more clearly defined, medium- to long-term priorities for specific regions within target countries;
- Address the real problems of the poorest people, as clearly defined by experienced staff;
- Restore the emphasis on hard science to reach a better balance between technical and social work; and
- Reduce the emphasis on Africa and increase it in South America and the Indian sub-continent.

With such basic measures in place, it is my belief that the DFID programmes will improve for the benefit of large numbers of poor people in the poorest countries of the world.

*September 2003*

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## APPENDIX 4

### **Memorandum from Michael S Philip**

I served in Uganda as a member of the Colonial Forest Service from 1947–64, then as a Reader in the Forest Department of Aberdeen University from 1964–88. Currently I am retired, but work part time as a thematic leader in forest management with DFID's Forestry Research Programme at Natural Resources International Ltd.—Programme Manager John Palmer and I am editor of *Forests, Trees and Livelihoods* an international, peer-reviewed journal.

### INFORMATION

1. A large proportion of the articles that I receive for publication indicate a lack of expertise in research planning and methodology in institutes in developing countries 1 even, sometimes, in those with international support and expatriate staff. This is in spite of the inputs from the Biometrics Advisory and Support Service to DFID based at the University of Reading This situation reflects the inexperience of the majority of the staff in these institutes and a lack of locally available expertise for advice and debate. Recently and to a limited extent, this has been mitigated through joint research projects linking UK and developing country institutions. An excellent example is the R6915 FRP project entitled "Growth and yield modelling framework to determine ecological and economic sustainability of managed tropical forest systems." The UK staff concerned visited and held many workshops in the countries involved—Indonesia, Malaysia, Guyana & Brazil.

*Recommendation*

2. I suggest that budgetary provision be made to enable scientists from the UK to spend regular, recurrent, short visits to research institutions with whom they have been associated, in order to discuss and review the latter's on-going and proposed research projects. Such arrangements should follow on from successful projects—such as R6915—for a period of, say, five years with, perhaps, an option for extension. Such an arrangement would provide the scientists in the overseas institutes with the opportunity to consolidate the expertise that had been passed to them during the life of the research project, and facilitate the application of that expertise to other problems.

*September 2003*

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**APPENDIX 5**
**Memorandum from Dr L A Bruijnzeel, Free University, Amsterdam**

It is with considerable concern that I recently learned of the intended termination of development-orientated research funding through DFID's respective Research Programmes.

In the more than 25 years that I have occupied myself investigating the consequences of land use change (deforestation, reforestation) on the hydrological functioning of tropical river basins and related impacts on people's livelihoods I have participated in numerous projects, some of which were funded by international donors, others by national science foundations based in European countries or the US, and still others by development-orientated agencies like the Dutch DGIS and the UK's DFID-FRP.

Based on this experience I have become convinced that internationally funded programmes are rarely useful because of their sheer size and often poor planning, whereas NSF-type projects are usually too narrow in focus and too small to be effective in this respect. Researchers generally pursue science for the sake of science without sufficient consideration of the practical application of their research results or of the need for capacity building in the countries where they operate. This also holds for the members of some of the Scientific Advisory Committees on which I have served. I have regularly seen applications for funding fail because of a perceived lack of scientific innovation even though the proposed work would have been useful from a development perspective. At the same time, such applications were considered too scientific to be supported by development cooperation funds.

At the other end of the spectrum, purely development-orientated projects (eg those funded by DGIS) usually lack the scientific rigour to produce the reliable results on which policy-making should be based. The millions misspent on tree planting in tropical areas to boost streamflows where in most cases a further reduction in flows is the only result, provide a sad case in point of serious misinformation on which policies can be based.

Programmes such as DFID's Forestry Research Programme in my view combine the best of two world's in that they are explicitly development-orientated (forcing the researchers to be practical and keep the beneficiaries in mind throughout the process), yet follow very high scientific standards in their projects to reach their goals. In addition (and in contrast with typical NSF projects), the associated project budgets are sufficient to include a significant training component and donate the equipment to the receiving country, thereby contributing much more effectively to capacity building.

I strongly believe that there is a distinct need for strategic environmental research in relation to improvements in the livelihoods of tropical communities. The fact that regular science does not seem to have an answer to such vexed questions as to how the declining dry season flows in degraded tropical areas (affecting the water supply to millions of people) may be remedied, illustrates the need for such strategic research. Solving such questions requires not only more funding than is usually available in a NSF-context but also much more focused and high quality research than is usually incorporated in development orientated projects.

*September 2003*

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**APPENDIX 6**
**Memorandum from Teaching-aids At Low Cost**

*A project supported by seed funding by KaR a programme of the UK Department for International Development*

For over 30 years TALC has been providing health information and training to health workers in Africa mainly in the form of books, slide sets and accessories. We raise funds to produce up to date materials that we distribute free or at low cost. We work with all levels of health workers and cover subjects from HIV/AIDS, tropical medicine to surgery. However the increasing cost of sending heavy items such as books limits this work.

We are now pioneering a new project sending information and training to health workers on CD-ROM. Our research has found that the availability of computers is increasing, but access to the Internet remains very limited. CD-ROMs, overcome this, they can hold a great deal of information and because they weigh little cost little to distribute.

We are developing Health Development CD-ROMs containing up to date copyright free information. An important aspect of this project is that we are encouraging health workers in Africa to provide us with information they produce which they wish to share with colleagues across the continent (or further afield) making the CD-ROMs a vehicle for South to South exchange as well as providing information from Western sources. A good example of this is the Ugandan Continuing Medical Education who publish their training material on each issue of the CD-ROM.

The CD-ROMs have been specially produced to be easy to use, self-loading and contain all the necessary software to view the resources (Acrobat, web browser and search engine) which are in pdf and HTML format. There are links to websites for those who can use them. We ensure that all material is of high quality, up to date and copyright free. It can be copied, e-mailed to colleagues or printed off as appropriate.

23,000 copies of the first three issues (we aim to distribute three issues per year) have been distributed and our database of users continues to grow. We have received excellent feedback from users. This is fulfilling an important need for health providers in Africa.

*A small sample of feedback from users of our CD-ROM*

1. we have received your CD-ROMs they contain a lot of good material which is relevant to our work here at Chogoria Hospital. I will be presenting some of the Cochrane Library material at our Journal Club increasing our base of evidence Based Medicine. This an ideal format for us since we have e-mail but not internet access

Dr John Potts medical Officer in Charge—Chogoria Hospital, Kenya

2. I got your CD-Rom from a friend. It is useful and educative especially for those of us here in the developing world where access to the internet and current medical information is very difficult. Thank you for developing such a CD-ROM.

Dr CJC Igoanus Paediatric Registrar—Nigeria

3. The contents are very educative and I really commend the effort of the organisations of e-talc. It has made the issue for updating ones knowledge on the new trends in health management extremely easy and interesting. References can be done easily and storage of information is extremely excellent.

Muhammad Sa'ad Pharmacist Nigeria

4. Well done to your team of experts who sat down and put together these masterpieces. I am confident that the wealth of information contained therein will make me a better doctor I look forward to receiving more copies

Dr Iliya Amaza

5. Our health team in this district have found an irreplaceable source of information that will help us as we create simple practical guidelines for rural health in ANC and Child welfare

Dr Simba S S Rep of South Africa

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## APPENDIX 7

### Memorandum from Dr Steven Belmain

I am writing to you in my personal capacity as a scientist working at the Natural Resources Institute, UK with a career spanning ten years of research within tropical agriculture and human health. I currently lead a number of collaborative research projects involving institutions based in Africa, Asia, Europe and Australia with a focus on the application of agricultural pest management and human diseases transmitted by animals (zoonosis). Although I have research funding from a number of donors such as the European Commission and charitable foundations, the majority of my research has been funded by DFID. In this context, I would, therefore, like to give you my personal experience with regard to the issues forming your inquiry.



*1. Co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM treasury, DTI, OST, FCO, the British Council and DFID.*

Working at the sharp end of science in development, I am not aware of any efforts to co-ordinate the UK research support. My own experience in developing countries suggests there is very little interaction between the two main UK role players in most countries, the British Council and DFID. DFID has officially untied its aid and has no interest in promoting UK science or strengthening UK science and development expertise. As a person working in development, I believe this DFID policy is correct; however, the policy does put UK scientists at a great disadvantage when competing against other developed country donor programmes. The current erosion of UK capacity to deliver science in development research could be reversed through the development of a more consistent government policy.

*2. Means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

I have little awareness of how DFID informs itself and makes its decisions. DFID occasionally produces consultative documents which are circulated for comment. As DFID has recently undergone considerable structural changes and is currently reformulating its research strategy, the consultative process has recently increased with the request for Researchable Issues. I understand that DFID has obtained several hundred submissions through this process from UK institutions, while none were received from developing country organisations. Most staff at DFID have been trained in the social sciences, and it is widely felt that their knowledge of the natural sciences and technology is lacking. I feel that this partly explains why DFID has become increasingly policy orientated as opposed to the delivery of knowledge and goods to developing countries.

*3. Extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes*

DFID operates very successful programmes of innovative research through their Renewable Natural Resources Research Strategy which target the Millennium Development Goals (MDGs). These externally and centrally managed programmes have funded collaborative research involving a range of stakeholders and institutions in Africa and Asia. As the lead researcher of a number of projects funded through this mechanism of DFID (particularly the Crop Protection Programme and Crop Post-Harvest Programme), my view is that these programmes have been a good investment in country level development through increasing the capacity of local institutions to conduct appropriate research and increasing innovation by encouraging developing country institutions to collaborate with each other and with international experts. DFID is one of the few donors operating research programmes which are so clearly focused on the MDGs and the livelihoods of poor people. I would like to encourage the Science and Technology Committee to ensure that such programmes continue beyond 2005 when the current DFID research strategy is due to end.

What I find most surprising is how little attention has been given to these research programmes by DFID in marking their success and in the strong demands from developing countries for more of this type of funding. It is indeed surprising and worrying that DFID did not mention their significant role in funding agricultural research when the 2002 DFID Department Report was reviewed during the Parliamentary International Development Inquiry on 18 June 2003, and particularly when Right Honourable Mr. Tony Worthington raised the issue of agriculture and technology and the apparent lack of its mention in the DFID report. I would like to encourage the Science and Technology Committee to ensure that the role of research in development is not further de-emphasised within DFID policy.

There are rumours that DFID internally believes its investments into research, particularly agriculture, have not been good value in achieving the MDGs. Although I have never seen a comparative analysis of the costs and benefits of investment into different sectors, I believe it is extremely important to remember that agriculture is by far the main activity of poor people and will remain their main route out of poverty for many generations to come. I would like to encourage the Science and Technology Committee to ensure that investments in agricultural research are appropriately balanced within DFID policy and investment strategies.

I believe that DFID is aware that their country-based programme offices have not always made good use of the DFID centrally funded research programmes. In my own overseas experience, I have found it very difficult to schedule meetings with country-based DFID staff, to encourage their attendance at stakeholder workshops generated by research projects and to generally inform them of active research endeavours in country and how this research could feed into DFID's bilateral efforts at the country level. I would like to encourage the Science and Technology Committee to ensure that DFID is able to effectively disseminate its research outputs.

4. *Progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes.*

My personal experience does not specifically focus on trade restriction issues; hence, I am unable to comment on the quality and quantity of progress made by UK institutions. DFID has supported very successful projects on ethical trade, pesticide reduction strategies, food safety and quality management, food management and marketing systems and other collaborative issues that will help meet this objective.

5. *Ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced.*

The experience I share with many of my colleagues is that the private sector is not interested in working with poor communities because of local government policies and high transaction costs. DFID policy of targeting the poorest of the poor will be difficult to implement with private sector collaborators without significant changes in local government policies and government subsidy to the private sector. The UK can play a role in influencing local government policy.

There is a very important role that the UK private sector and public/private partnerships can play in strengthening local institutional capacity. Increasing collaboration between small/medium enterprises, NGOs, researchers and international experts and companies will build this capacity. Relative to other large donors, DFID has been at the forefront of affecting such collaborations through their research programmes and should be encouraged to continue. In the past, DFID funded many highly regarded Technical Cooperation Programmes which, if revived, could significantly impact upon this goal. Increasing sponsorship of higher education students from developing countries to study to Masters and Doctorate level linked with increasing local public and private sector employment opportunities will also help meet this goal.

6. *Extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries*

The high regard given to UK higher education institutions by developing countries and the number of students from developing countries previously and currently enrolled in UK education should partly indicate the importance and success of formalised UK training. My experience within the DFID research programmes is that informal staff training and learning is much enhanced through collaboration and the participatory approaches used in modern overseas development research programmes. The DFID renewable natural resources research strategy has strongly emphasised community participatory research, which is, itself, training provision to end users of technology. I believe that the UK has been, and will continue to be, a major source of formal training for students and institutional staff from developing countries. However, greater efforts should be made to provide applied training inside developing countries that involve students and staff in the research and development process through international collaboration. Science and technology thrives through collaboration, and the UK must ensure that UK scientists and those from developing countries can work together within a policy framework that actively encourages international collaboration.

October 2003

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## APPENDIX 8

### Memorandum from Dr Adrian Newton

#### PERSONAL BACKGROUND

Previously I have worked for the Centre for Ecology and Hydrology, the University of Edinburgh, and for the United Nations Environment Programme, as a researcher. In total I have worked on or been directly responsible for managing a total of eight research projects funded ODA/DFID, to a total value of some £1.7 million. These have been of great value for my own personal and professional development, and have provided me with an opportunity to gain first-hand experience of working in a large number of developing countries. It should therefore be noted that the comments provided below are from someone who has benefited personally from the investment of ODA/DFID in research. My experience stretches over a period of 14 years, so some of the comments made below relate to the ODA rather than DFID, but the two are considered here jointly. It should be emphasised that the comments below are very much a personal perspective coloured by my own experience, as a researcher in forest science and its application to overseas development.

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*Points for consideration*

1. DFID has made a substantial investment in research, which has generated a great deal of information. However, only a very small proportion of this information is accessible, either to the international research community, institutions or individuals in developing countries, or even the in-country DFID staff that the research projects were often explicitly designed to support. There is no central repository of information generated by DFID research and it is even difficult to ascertain which areas of research have been supported in the past. There is a great deal that DFID could therefore do to improve access to research information already generated. By not doing this, DFID is failing to capitalise on the investments already made in research, and runs the risk of duplicating research that has already been undertaken. There is therefore an urgent need to transfer the knowledge that DFID research has already generated. It is recommended that DFID create an internet-based, open-access research archive providing access to research outputs generated by previous projects, incorporating a searchable database of previously funded projects. Such an archive would also raise awareness of the value and impact that DFID-funded research has had; this is an area where DFID has been very weak.

2. For an organisation that has invested so heavily in research in the past, it is strange to encounter within DFID a widespread lack of understanding of the value of research, and what it can offer. There may even be prejudice against research within DFID staff—how else to explain the (frankly bizarre) practice of explicitly not appointing people with higher research degrees to overseas postings? I have repeatedly seen the tensions that this policy has caused, with UK project staff working alongside counterparts who are better qualified than they are—because the developing country institutions better recognise the importance of research skills among technical staff. Perhaps this kind of prejudice stems from the perception that research is the exclusive domain of a scientific elite. The result of this kind of policy is that there is widespread ignorance among the UK development community, and perhaps also among Government departments, of what research can offer. It is worth emphasizing that research is not a commodity that we can choose to have or not; it is a process of solving problems. In fact it is the only tool that we have that actually generates knowledge. The only alternative method for solving a problem is trial and error. DFID should therefore reiterate its commitment to research, and strive to increase understanding among its own staff about the value of research. It should also seek to appoint staff with professional research experience to increase the capacity of the organisation to both understand what research can offer, and to apply the results that it generates.

3. The most cost-effective way of undertaking a programme of research is to employ post-graduate students to do the job. There is no doubt that provision of post-graduate training is something that the UK higher education sector excels in. Post-graduate degrees from UK Universities are eagerly sought after by people from developing countries who are keen to pursue a career in some aspect of development. Yet, despite a large number of applications from promising candidates, relatively few are able to register successfully for a higher degree in the UK, because of a lack of funding. Ironically, it seems easier to secure funding for a Masters degree than a PhD. I have never understood the DFID/British Council policy of preferring to fund Masters rather than PhD students. A Masters degree provides only superficial training in research skills, and there are often many alternative sources of funding available for such a degree. PhD students from overseas are much more difficult to fund, despite the enormous value of training to PhD level for the individual concerned. There is enormous demand from potential PhD students. I have personally supervised more than 20 such students from developing countries; they have all returned to their countries to develop successful careers, often in senior posts (including government ministries) where they have managed to have a real impact on development. Very few of these were funded by the UK Government. The training that an individual receives during a PhD degree is of unequalled value in terms of providing the skills needed to tackle problems rigorously, and this point seems to be better appreciated in developing countries than within the UK Government departments. There is no doubt in my mind that the most cost-effective way that DFID, and other UK Government departments could invest in high-quality research, as well as make a major contribution to training and capacity-building in developing countries, would be to substantially increase its level of support to overseas students wishing to undertake a PhD at a UK University. This would have the added benefit of helping to maintain the capacity of the UK Higher Education sector to undertake research in developing countries. It should be emphasised that many UK Universities are able to offer “split” PhDs, where the student undertakes fieldwork in their own country but receives training in the UK—this is often preferred by the students themselves.

4. How should DFID provide financial support to research? In the past, core support has been provided to preferred organisations such as the Natural Resources Institute and the Oxford Forestry Institute, among others. Such core support has declined in recent years and there is no doubt that this is regretted by some, who perceive the UK research capacity declining as a result. I am personally much more sanguine about this trend. Partly, this change reflects a shift away from sectoral research—such as agriculture and forestry, my own field—to the current commitment to poverty alleviation. My own perception is that this shift is respected and appreciated not only by other donor organisations, but by target countries. What this has resulted in, though, is a much more complex kind of research—whereas in the past it might have sufficed to investigate one particular technical problem relating to the cultivation of a crop or tree, now the research often has to embrace social and economic aspects as well. Personally I welcome this shift, but there is no

doubt that the trend towards larger, more inter-disciplinary projects and away from purely technical research has disenfranchised some researchers. I also applaud the trend towards opening up the funding process and making it more transparent; in the past it seemed that funding was being provided en bloc to certain preferred institutions who were not exposed to external competition. Did the quality of DFID-funded research suffer as a result? I believe that it did. I can think of many examples where DFID has squandered financial support on research that has provided not only limited value to development, but little in the way of a contribution to science. I believe therefore that DFID should continue the trend towards providing research funding in schemes that are open, competitive and transparent, and avoid providing large block grants to preferred institutions.

5. My belief is that scientific researchers may be the best people to advise on how research should best be undertaken, but are not necessarily the best people to advise which research should be undertaken. There is a tendency among some researchers to promote their own field of study regardless of what problems actually need to be solved. There is no shortage of problems in the development sphere, but often the research that is undertaken is not closely linked to the problems that need solving. Perhaps this reflects the pressures on academics to undertake “fundamental” research to further their careers, whereas what is needed in the development field is very much applied, problem-solving research. This can easily be addressed by providing funding streams that are directed to support specific problems that have been identified by the potential clients of the research. Without doubt, there needs to be increased dialogue between DFID and the potential users of the research in developing countries. Ideally there should be mechanisms where developing countries could identify a particular problem that they have, then invite the UK research community to help them solve the problem, with the support of DFID. This sounds logical, but in my experience this process happens very rarely at present. Why is this? Is it because the research priorities set by DFID are identified by UK researchers? Or are DFID staff overseas not in close touch with potential research clients? My guess is that there may be a need for strengthening capacity not only within DFID, but within counterpart organisations in developing countries, to help them understand what research can offer. DFID should seek to develop a mechanism so that research problems are identified by potential users of the research in developing countries, then communicated back to the UK research community.

6. Is there a better model available for funding research? I believe that there is. I think that the Darwin Initiative programme managed by DEFRA has been an outstanding success (note: I speak as someone who has personally benefited from this funding source also). The programme is relatively small, and makes relatively small grants. The precise problems to be addressed are not defined but the programme stipulates a series of criteria that should be met by proposals (including poverty alleviation, of course relevant to DFID’s interests). There is a focus on training and capacity building as well as research. There is a strong focus on dissemination of results. And all projects have to be joint collaborative ventures between UK and overseas organisations. There has also to be demonstrable proof of need of the project, and it demonstrably has to be policy relevant. The application process is also open and transparent, and is open to a very wide range of UK institutions—including private sector and non-governmental, charitable organisations. I find this list of requirements hard to improve on, and I believe that all of these requirements are equally relevant to DFID. Darwin projects are designed to be catalytic and to attract further funding—my own projects have been spectacularly successful in this regard and as a result have left a lasting legacy in the host countries. I say this not to boast, but to contrast the situation with the DFID projects that I have managed, where this certainly has not happened—nor was it ever sought by DFID. I therefore recommend strongly that DFID examines the Darwin Initiative as a potential model for providing funding for research and training. Incidentally, it strikes me as odd that DEFRA is arguably having greater impact using research to support development than is DFID, despite devoting a fraction of the resources to it. Is there not scope for some joined-up government in bringing these departments together—for example a coordinated approach to providing funding for research and training?

7. What is the role of the research councils? I can speak here only of the one with which I am familiar—NERC. My opinion is that NERC funds very little research of direct value to overseas development. I have personally never attempted to secure financial support for my overseas research from NERC, and know of no-one else who has been successful in gaining support for applied, development-related research from them. Why is this? My own belief is that NERC is too tightly focused on supporting “blue skies”, fundamental research. It explicitly does not support research that aims to help implement government policy. I find this stance quite extraordinary, as someone who believes that publicly funded research should be accountable to the public that pay for it—I firmly believe that research should have some societal relevance. This is not the stated aim of NERC. I believe that this is because the decisions regarding what should be funded are made by scientists, and as noted above, this leads to a situation where the whims and prejudices of scientific researchers dictate what gets funded. What is the implication of this? To me, it is clear: if the UK government wishes to continue to support research that is relevant to overseas development, then it must do so through DFID/DEFRA/FCO, as it cannot rely on the research councils to do this—they completely fail to do so at present, in my experience. I accept that the situation with other research councils, such as MRC, may be very different.

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## APPENDIX 9

### Memorandum from the Institute of Grassland and Environmental Research

The Institute is one of eight BBSRC sponsored Institutes and carries out (*inter alia*) basic, strategic and applied research of relevance to grassland-based livestock systems. The Institute has had a long-term interest in various aspects of tropical agriculture, with particular emphasis on plant-breeding for tropical forages and mixed-use cereals such as pearl millet.

The DFID research strategy emphasises poverty reduction. We applaud this vision. However, we question the shift of emphasis on research strategy to the individual country desks. We believe that there are certain research elements that are more generic and that benefit from longer term research than that likely to accrue in a project-based system oriented towards individual countries. We feel that crop based research is one of these elements.

There are two advantages to facilitating integrated crop-based approaches. The first is that it is much easier to achieve critical mass and to establish links with a range of beneficiaries. This, in turn, facilitates institutional strengthening in developed countries via study leave, joint projects, etc.

The second is that it provides a very effective model for the deployment of relevant new technologies in a manner that allows universities and institutions in participating developing countries to incorporate them effectively. Participatory research promotes knowledge uptake and research relevance, however it is important to ensure that scientific innovation is not stifled as a result.

We believe that the establishment by DFID of research management groups like the Plant Science Programme has been a success, and has served to provide vital certainty of investment that has paid dividends (as for example in the case of the research in precision breeding of pearl millet begun 10 years ago which has led to a range of novel hybrids with improved resistance to both drought and mildew currently in variety trials in India). This research has come to market in an original and effective manner because long term strategic support was forthcoming via the Plant Science Programme. We urge the committee to recommend to DFID that such focus and integration should remain a building block of the new strategy.

October 2003

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## APPENDIX 10

### Memorandum from Martin Hodnett

Over many years of working on DFID funded projects, particularly in the capacity building sector, I have observed a move away from science, research and capacity building within DFID funding. This appears to have been driven indirectly by the relatively recent, and very laudable focus on poverty elimination, which has led some to question the value of research, eg—“what has scientific research done to help the poor? We have seen £xx million spent on, eg dryland farming research—where are the benefits in terms of improved livelihoods?” I have also heard the case against research voiced in the following terms (by a respected economist)—“don’t we know enough already? Should we not be just applying what we already know?”

A range of arguments along these lines seems to have been taken as a justification to reduce the amount of science and research supported by DFID funding, but the arguments are short-sighted and unhelpful.

The argument “should we not be just applying what we already know?” seems to be making a fair point, but it will condemn the people of third world nations to a far smaller investment in research to support livelihoods and health than has been enjoyed by those in the first world. This is unsupportable.

A key factor in managing environmental systems can be summed up in the statement “one cannot manage [properly] what one does not understand”. In Europe and North America, agro-environmental systems have been relatively well researched and are hence fairly well understood. The same cannot be said of these systems in the third world. In addition, research in first world systems (mainly temperate) is often not applicable to third world (usually tropical) environments and agricultural systems.

The role of science, and scientific research, in poverty elimination and in sustainable development should not be in dispute. That its importance should be questioned is alarming. Science has a vital role to play, not alone, but as a contributor, alongside other important skills and disciplines. However, it is recognised that technologically driven solutions often fail when applied without due consideration of all of the circumstances in which the very poor find themselves.

The DFID White Paper “*Eliminating World Poverty—A challenge for the Twenty First Century*” (paragraph 2.42) states that “knowledge, research and technology underpin all our work”. The importance of science and research is also effectively implicitly recognised in the sustainable livelihoods approach (SLA), which provides an interdisciplinary framework for evaluating livelihoods. I quote from “*Implementing the Sustainable Rural Livelihoods Approach*” by Diana Carney (DFID 1998), in several places below.

The SLA defines five different types of assets, or resources (also called capital) upon which individuals (and families and communities) draw to build their livelihoods. These assets are:

- Natural
- Social
- Human
- Physical
- Financial

Natural capital is: “the natural resource stocks from which resource flows useful for livelihoods are derived (eg land, water, wildlife, biodiversity, environmental resources)” (essential would be a better term here rather than merely useful!)

“A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, *while not undermining the natural resource base*” (my italics)

“however, while it (the SLA) starts with people, it does not compromise on the environment. Indeed, one of the strengths of the livelihoods approach is that it “mainstreams” the environment within a holistic framework”.

The importance of the environment is clearly stated, and implicit in this importance must be an understanding of how the environment functions, so that it can be managed, and impacts can be predicted. In addition, there must be the means and capability to evaluate the “natural resource base” so that it can be judged whether the resource base is being “undermined”. These require both research and capacity building.

Although the importance of science and research should not be in dispute, the way it is used to assist in poverty elimination almost certainly needs to change.

There is a view that the funding of scientific research is not the function of DFID, but that of organisations such as NERC, or the US NSF. This view should be challenged. The latter concentrate on academic, “blue skies” research (or new and “sexy” science). This may—ultimately—have applications to poverty elimination, but these scientific funding agencies generally have little interest in solution oriented, problem solving science.

DFID should fund scientific research, but research with clearly defined avenues leading to poverty elimination, and improvements in health. Ideally this work should be identified by scientists working in interdisciplinary teams working with eg NGOs at the “sharp end” of aid work. There may also be cases where there needs to be funding for longer term strategic research, with a clear pathway towards poverty elimination. If DFID don’t fill this gap, funding well focussed and appropriate research, the necessary science just will not get done for the people who need it most.

Who should carry out the research? Some countries do not have well developed scientific communities, and this is where capacity building is vital. However, this capacity building must focus on problem solving, rather than academic research—which require different mindsets! In other countries, there is no lack of experience and capability.

I fear that some of the arguments against science and research may originate in competition between disciplines for research funding driven by the need to maintain funding for departments in the University sector. This is unfortunate and does not help the development of a multidisciplinary and holistic approach. Such approaches are vital, but there are challenges in getting different disciplines to work together—with mutual respect. This is a factor that should be recognized and addressed.

A word about soils—dirt, overburden or a vital resource?

Despite the fact that soil is a vital resource on which all terrestrial food production depends, it tends to be ignored, and as a result, taken for granted. All the while it is being lost by erosion, and degraded by inappropriate cultivation practices, monocropping and salinisation, all of which are reducing its potential productivity. This is happening at a time when agricultural production must keep pace with the rising world population.

Much of the overall degradation and erosion is occurring in tropical countries where subsistence agriculture is often vital for survival. As mentioned earlier, the amount of research that has been carried out on the soils in tropical regions is far less than in temperate regions, and the problems are more critical.

Soil is also very important in hydrological terms. Degradation of soil structure, changes in vegetation cover, and tillage practices have marked effects on the water balance, altering the balance between infiltration and runoff, which can have profound effects on surface and groundwater resources. Aquifer recharge may be reduced, causing wells to dry up and streams to stop flowing in the dry season. This can lead to much hardship in poor communities.

To sum up:

- Science and research has a vital role in poverty elimination;
- The science should be focused on the important issues related to poverty elimination;

- DFID and other aid agencies should fund this science;
- If DFID or aid agencies will not fund it, no one will;
- Multi-disciplinary / holistic approaches are vital, and should be fostered; and
- For sustainable livelihoods, we must be able to evaluate the natural resource base and understand how the environmental systems function, in order to be able to manage them.

October 2003

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## APPENDIX 11

### Memorandum from Outside Echo Ltd

Before founding Outside Echo (not-for-profit limited company), I was Technical Lead in HP Labs Bristol for nine years, working in speech and language technology. I became aware that if technologies such as Text-to-Speech (TTS) and Automatic Speech Recognition (ASR) were available in the local languages of the developing world, then the (mobile) phone could be used to allow widespread access to medical, market pricing, weather and other timely information, as well as email and on-line transactions. However, TTS and ASR require both linguistic and specific technical expertise to develop, and currently are only available for the world's major languages—at considerable cost as a lot of work is needed for each language.

My conviction was (and is) that the only way these technologies could ever be produced in the world's local languages is by enabling scientists/linguists/engineers in those countries to develop the capability themselves. Myself and some colleagues wrote a vision paper for a “*Local Language Speech Technology Initiative*”, which would bring together motivated groups in developing countries, providing tools, expertise, support and training to enable first TTS and then ASR to be developed in their own local languages and made available as open source.

After almost two years, we have managed to get some initial funding for LLSTI from DFID, and myself and a colleague have left HP to found Outside Echo to run LLSTI, with partners in India, South Africa and Nigeria. Essentially we are bridging the gap between the (first) world's speech and language engineering community and the people in the developing world who could benefit enormously from the technology. However, we have still to discover a means to sustain the initiative in the longer term.

In addition, there is a lot more research to do on how best to produce TTS/ASR in these local languages, and finding funding for this research is another challenge we now have to face. My overwhelming impression of the UK academic community and their funders is that research is focused on the needs of UK Industry and issues of scientific importance to the UK. I would love to see a shift towards a more global view, and hope that one of the outcomes of your inquiry will be to enable this.

October 2003

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## APPENDIX 12

### Memorandum from the Harefield Research Foundation

The Harefield Research Foundation (a company limited by guarantee) is a charitable organisation formed to protect and advance the pioneering research work carried out by Professor Sir Magdi Yacoub and the research team that he has assembled at the Heart Science Centre at Harefield.

#### THE IMPORTANCE OF RESEARCH IN DEVELOPING COUNTRIES

In a recent lecture given in Boston by Professor Yacoub, he made the following points regarding the importance of research in developing countries

##### *Size of the Problem*

- Massive divide in life expectancy from 25–78 years;
- Global burden of disease, mortality and morbidity;
- Disease and lack of knowledge as causes of poverty; and
- Compared to their counterparts in the developed world, young people in the developing countries are 100 times less likely to enter a scientific career.

#### *Advantages of Research in the Third World*

- Develop local expertise;
- Provide opportunities for talented people;
- Realisation of the size of the problem by all concerned locally;
- Generate specific answers for local problems (neglected diseases);
- Science—Technology—Health and Wealth;
- Enhance dignity; and
- Participate and contribute to global knowledge.

#### *Potential Sustainable Solutions*

- Twinning programmes;
- International programmes;
- Targeting neglected diseases;
- The concept of a tripartite research centre (epidemiology, high tech medicine and molecular);
- NGOs joining efforts with the Government bodies;
- Creation of global network of culture and science; and
- Role of the individuals and universities.

#### *Difficulties*

- Deficient funding sources (only a few countries contributed the 0.7% of their GNP recommended by the UN);
- Lack of channels and expertise to administer funds for research at that level;
- The role of local Government, World Bank and Global Fund; and
- Infrastructure support of research.

#### ADVANCING SCIENCE IN MOZAMBIQUE

At the end of 2002, the Harefield Research Foundation set itself two goals, the first being to establish a basic science/clinical research study into the causes of Endomyocardial Fibrosis (EMF) and the second to use the study as the first block in building a sustainable research capability in Maputo, staffed and operated by local people.

#### *Endomyocardial Fibrosis (EMF)*

Endomyocardial Fibrosis (EMF) is the cause of high morbidity and mortality in some regions of Mozambique. It is a progressive cardiac disease which is most common in children and young adults, having been reported as early as the age of two years.

EMF is observed mainly in the tropical climate and, as well as in Mozambique, it is frequently found in Uganda, the Ivory Coast and Nigeria. This disease has also been found in Asia in the Indian state of Kerala, as well as in Brazil and Venezuela. It is more common in the lower socio-economic groups but short term visitors to an endemic area may acquire the disease.

EMF is one of the most neglected diseases affecting several million people in tropical areas and causing premature deaths in a considerable number of patients in the endemic regions. Epidemiological studies undertaken in Mozambique confirm that EMF is a serious health problem in some regions of the country and, with the exception of rheumatic heart disease and congenital malformation, is the most common reason for admission of children to hospital with a cardiovascular disease.

For many years scientists have studied EMF as an isolated clinical and pathological entity, searching for a singular cause without success. EMF is probably hystopathological syndrome determined by one or many mechanisms, each being probably stimulated by more than one etiological factor acting upon an already predisposed population due to genetic or environmental factors.

In this context of frequent disease with no adequate treatment, operational research combining both basic science and clinical aspects is necessary in order to identify the causes of the disease and to work towards prevention.



*The Project*

To conduct basic science/clinical research into the causes of EMF and facilitate a possible cure.

Professor Sir Magdi Yacoub has performed many surgical operations in Mozambique on missions with the Chain of Hope charity and had acquired a good knowledge of the clinical capability in Mozambique. The Institute do Coracao in Maputo is collaborating with the Research Foundation in the EMF project and will provide land adjacent to the Institute for research buildings to be provided by the Foundation. The project also has central and regional government support and all levels of civil servants have been as helpful as possible.

It may be of assistance to the Science and Technology Committee to be informed of some of the difficulties that the Foundation has encountered to date.

It is necessary to be fully aware of the infrastructure difficulties arising in countries such as Mozambique and that, whilst the offer of the use of facilities at a medical centre in a district 600 kilometres from the capital appears to solve the problem of a local base whilst collecting blood samples, the condition of the building, the lack of running water and constant electricity (available for four hours per day only) made the installation of something as simple as a freezer a problem that was not envisaged when plans were drawn up in Harefield. It will be necessary to provide a portakabin-style building with its own power supply and, on the subject of power, diesel or petrol generators are available and solar panels (in a country where the sun shines on a regular basis) are not.

The clinicians that we encountered were keen to learn, enthusiastic, hard-working and, in some cases, obviously extremely intelligent but there are few of them and technicians to assist in taking blood samples are equally rare.

The provision of reliable and sustainable information technology is a problem in Mozambique and reliance on South Africa for technical support is the standard way forward.

None of the difficulties encountered are in any way insurmountable and the detail provided is to indicate that initiating a project is more expensive and takes longer than maybe anticipated.

Professor Yacoub and the Foundation believe that the way forward for research in countries such as Mozambique is to provide funding equipment, support and training where possible in Mozambique in a research institute which will start as a small building and which will grow as the knowledge of the local people grows.

It is hoped that with charities such as the Foundation providing this initial support and proving that meaningful scientific research can be undertaken by local people in their own country for the benefit of their own people (as well as the international scientific community), national governments and international organisations in the western world will provide second-stage funding to enable the local research institute to expand and move towards sustainability.

*Conclusion*

Professor Yacoub's lecture in Boston ended with the following quotation from Ismail Serageldin "Science can help to feed the hungry, heal the sick, protect the environment, provide dignity in work and create space for joy of self expression".

At HRF, we believe the NGOs can provide start-up funding and support for the first stage of research projects in developing countries and provide a degree of confidence in the ability to perform and the validity of research sufficient to justify its existence. The second stage of development requires time limited resources (finance and scientific support) at Government or International level which will deliver the third stage of local sustainable scientific research.

October 2003

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**APPENDIX 13**
**Memorandum from CSIRO Sustainable Ecosystems**

This submission is based on the experience of a team of scientists from CSIRO, Australia's national science agency, who have had 10 years experience working in developing countries in Asia. We draw specifically on a current research project funded by DFID in the agricultural sector in Bangladesh. We also draw from our close collaboration over the past decade with many UK scientists from the Natural Resources Institute, the Central Science Laboratory, the Natural History Museum, Imperial College and from private industry.

1. My team of scientists has been involved in a three year project in Bangladesh (2002–05) that is led by UK scientists at NRI and involves two Bangladeshi Government research agencies, a local NGO agency and strong participation by small-holder farmers. The focus is on capacity building of scientists and research staff, and farmer participatory research. The scientific skill base provided by the UK scientists is essential

for the success of the project. These skills are available only at a rudimentary level in Bangladesh. Moreover, the Bangladeshi scientific counterparts have little experience of working with villagers—away from government research farms.

2. The major impact of the project has been the building of capacity in-country through the transfer of knowledge and on-the-ground demonstration of techniques (social, economic and biological). The training of NGO field and extension staff has had a greater impact than simply training in-country scientists and post-graduate students. The ability of the UK staff to provide appropriate training for people who have a wide variation in prior knowledge and skills is indeed impressive. The impact of the research at the community level is still being assessed, but the NRI staff have gained strong community involvement and local ownership of the project.

3. The strong specialist support to the agricultural sector supplied by the UK through DFID funding and institutions such as the Natural Resources Institute and the Central Science Laboratory is important to address the enormous issues associated with improving rural livelihoods, health and well-being of small-holder farmers in both developed and developing countries. UK scientists have the multi-disciplinary technical skills, experience with project management, and practical on-the-ground experience that is in huge demand in developing countries throughout Asia. These skills together with the ability of UK scientists to train local counterparts and students in different specialist areas are essential for building capacity in agriculture and natural resource management in a region where the capacity is clearly lacking.

4. Our experiences from 10 years work in SE Asia on agriculture and natural resource management issues have clearly shown that engagement with senior government officials, strong partnering with institutions in-country and internationally, and promoting participatory research with end-users, has led to effective capacity building and adoption pathways. The DFID guidelines do not facilitate partnerships with non-UK agencies. This perhaps need to be reviewed—DFID's portfolio in SE Asia for example could be considerably strengthened if a sub-set of funds are used to leverage partnerships with other developed country funding agencies in the agricultural and governance sectors (eg the Australian Centre for International Agricultural Research (ACIAR), AusAID, SDC). Having said this I hasten to add that DFID does consider value-adding through partnerships. Their funding of the Poverty Elimination Through Rice Research Assistance (PETRRA) program in Bangladesh through the International Rice Research Institute is an excellent initiative.

5. I conclude with a general observation. Our experience in collaborating with UK scientists in the agriculture and natural resource management sectors has been extremely positive. There are so many important issues that people in developing countries face now, not tomorrow, with regard to livelihood issues. We have been impressed by the preparedness of UK scientists to:

- focus on the immediacy of the need to apply outputs of their research;
- develop effective collaboration with other international agencies, such as CSIRO, to approach projects in a well managed multi-disciplinary manner; and
- work closely with NGOs, extension agencies and representative end-user groups to provide a framework for rapid and (hopefully) sustained adoption of outputs from projects.

It is therefore not surprising that we continually find in our travels that UK scientists in the agricultural and natural resource management sectors are held in very high regard by government officials, scientists, NGOs and small-holder farmers in developing countries in South Asia and South East Asia. Also an important outcome of their research is that they are beginning to influence policy in the natural resource management and agricultural sectors in two countries where I have been following their research outputs and adoption—Bangladesh and Mozambique.

*November 2003*

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## APPENDIX 14

### Memorandum from the Information Core for Southern African Migrant Pests

The Information Core for Southern African Migrant Pests, known as ICOSAMP (DFID No:R7890) are an active network of migrant pest collaborators in eleven member countries of the Southern African Development Community (SADC), striving to protect the food security of the Region from the ravages of pests such as armyworm, locusts and *Quelea* birds.

The Plant Protection Research Institute of the Agricultural Research Council (Pretoria, South Africa) in collaboration with the Natural Resources Institute (UK), established the SADC endorsed network in 2001. The project is funded by the UK Department for International Development (DFID), and is currently in its' second phase of development.

Collaborators provide up-to-date information on migrant pest movements in their countries which is summarised in a monthly Bulletin and posted on the ICOSAMP website at <http://icosamp.ecoport.org>

1. *Co-ordination of research support and UK Government Policy on the use of science in development policy*

Monetary support received from DFID, and scientific expertise gleaned from the NRI (UK) has provided member countries of SADC with an Early Warning System for migratory pests. This information enables decision makers to foresee impending invasions and mobilise control operations, thereby protecting the food security of their country and the SADC region as a whole, and ultimately contributing to poverty alleviation.

2. *Extent to which investment in research and the promotion of innovation plays a part in DFID's country level development programmes*

During the first Phase of the project, SADC country collaborators were so impressed with the development of the central computer based system (GIS linked to an Access database), that they requested the Co-ordinator to investigate the option of providing EACH country with a similar system. Phase 2 of ICOSAMP is therefore almost exclusively focused on developing these country-specific systems, and these will be operational by 2005.

3. *Progress of UK efforts to build scientific and technological capacity in developing countries to help overcome trade restrictions, and co-ordination of these efforts with NGO's, charities and international programmes*

ICOSAMP is achieving international recognition through its collaboration with EcoPort ([www.ecoport.org](http://www.ecoport.org)), the IRLCO-CSA (International Red Locust Control Organisation of Central and Southern Africa, Zambia), AELGA, and the FAO Desert Locust Control Organisation. The success of ICOSAMP has also spurred requests from SADC countries to include the monitoring of man-borne pests such as the Larger Grain Borer, which has a negative impact on cross-border trade in the Region.

4. *Ways in which the role of the UK private sector and public/private partnerships in S&T research in knowledge transfer for the benefit of developing countries can be enhanced*

The Technical Advisor to the SADC-FANR (Food Agriculture, Natural Resources) suggested at a Regional Early Warning meeting held in Gaborone (Sept 2003) that ICOSAMP be established as the "clearing house" for ALL migrant pest issues in the region such as regional policy issues and insecticide regulations. This can be achieved with the combined input of experts from the ARC-PPRI (Dr Roger Price, locust policy consultant on FAO panel), personnel at the NRI (UK), and assistance of FAO experts.

*General Comments*

Science and Technology has thus been used very effectively in the development of ICOSAMP through:

- Establishment of a communication network via an email forum;
- Implementation of standardised SADC regional reporting forms, one for each of the migrant pests, based on sound scientific knowledge of each pest;
- Monthly Bulletins and GIS pest distribution maps—produced from a user friendly computer system;
- A website;
- Workshops to train collaborators on the use of the system and to raise the standard of reporting; and
- Establishment of the first SADC Regional migrant pest database, currently containing more than 1,500 records of migrant pest movements since January 2001.

November 2003

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**APPENDIX 15**

**Memorandum from Paul Latham**

*"The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced".*

Over the past seven years I have been involved, as a retired agriculturalist, with a rural development programme in the lower Congo (DRC) which seeks to assist people to be self supporting. The programme is operated by the Salvation Army and works in the Bas-Congo province. With the help of a grant from

DFID, via NRInternational, a series of farmers booklets and teaching manuals has been prepared which have been well received by farmers, schools, health workers as well as the rural development workers on the programme.

Titles so far produced are:

- Reboisement en Bas-Congo;
- Chenilles comestibles du Bas-Congo;
- Les champignons comestibles du Bas-Congo;
- Quelques legumes locaux du Bas-Congo; and
- Apiculture en Bas-Congo.

Each booklet has been written and illustrated by local people, combining local knowledge and best practice, so that the booklets are relevant to local conditions.

*From my experience in the Congo I believe there is considerable scope for the development of low cost publications of this nature for other areas.*

Currently I am working on a more technical publication on the useful plants of Bas-Congo. Information for this is being gathered from a wide variety of people who either live and work or have lived in the province with the aim that knowledge accumulated over many years will not be lost.

*Again I believe that DFID could well assist individuals and organizations to collect practical information on the growing, preparing and uses of plants in countries where this information is still available, though risks being lost in the future.*

November 2003

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## APPENDIX 16

### **Memorandum from the Oxford Forestry Institute, Department of Plant Sciences, University of Oxford**

1. The Oxford Forestry Institute functions within the University of Oxford's Department of Plant Sciences in the areas of forestry education, research, and information services. The Institute has a long history as a centre of excellence in forestry research, particularly in tropical forestry. DFID/ODA has funded most of the tropically-oriented research at OFI over the last 40 years, through its Forestry Research Programme. Through association with CAB International the Institute's library has developed as the world's leading centre for forestry literature accession and dissemination.

Research currently undertaken within the Institute includes:

- forest biodiversity; conservation and sustainable utilization of forest genetic resources;
- forest ecology, silviculture and management; and
- agroforestry.

2. *We present evidence on the following specific points identified by the committee.*

- The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID;
- The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes;
- The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes; and
- The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.

3. *The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID.*

UK funding for applied natural resources research (both abroad and in the UK) of the type that is relevant to developing country problems and priorities has decreased dramatically in recent years. The perception that it is hard to achieve a positive impact on rural livelihoods through technical research (see 4.2 below), has led to its virtual removal from DFID's priorities. Although the UK research councils fund much

fundamental natural resources research, the councils don't regard the more applied aspects as falling within their remit; nor does the research they fund encapsulate the more integrated approach that is required if the research is to have a significant and attributable impact on development. Only the Darwin Initiative (DEFRA) attempts to fill this vacuum, although it is not of the scope (only covering biodiversity research), size, or continuity required to have a significant impact on its own.

#### *4. The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes.*

##### 4.1 Critical depletion of UK technical expertise in tropical forestry research and training

The fundamental shift in emphasis within DFID over the last 10–15 years, away from technical and biophysical interventions towards more holistic livelihoods-based approaches, has also been reflected in revised priorities for research funding in natural resources, within the Renewable Natural Resources Research Strategy (RNRRS). There has been an increasingly heavy emphasis on socio-economic and policy-oriented research, with very little funding now available to address researchable technical constraints. In reality, of course, the sustainable use, management and conservation of trees and forests require both: a sound scientific and technical basis, underpinning a conducive policy framework. In the past (up to the 1980s), research tended to focus on the former and ignore the latter: but we believe that the emphasis has now shifted too far in the other direction. Whilst welcoming the more holistic approach enshrined in DFID's livelihoods-based policies, it is now time to recognise that appropriate, targeted and demand-driven biophysical research must also continue to have an important role. There remain countless researchable technical constraints to sustainable development and poverty alleviation, which realistically cannot be addressed without donor support.

The reduction in funding to forestry research in UK is not confined to DFID. An overall decline in UK agriculture and forestry research is highlighted in *A Review of UK Environmental Science, Final Report* (Environmental Research Funders' Forum 2003). A significant drop in publications and citations has occurred over the last five years.

The shift away from funding of biophysical research has already led to the disbanding and dispersal of previously strong and effective research teams and North-South collaborative networks. The reversal of this trend is desirable and possible, but it will be a slow and difficult process, and will become more so the longer the current imbalance is allowed to continue.

The undermining of this research and training capacity is also causing a loss of the competitive advantage and influence once held by the UK. Increasingly developing country scientists are seeking natural resource solutions from other sources who offer funds and training opportunities, with less development oriented agendas.

##### 4.2 The need for effective delivery mechanisms if science is to achieve impact

Research results are only useful if they are taken up by the intended beneficiaries and create a positive impact. This depends on the existence of effective linkages from the researchers, through change agents and policy makers, to the end users in the target countries. An important reason why some of the biophysical research funded by DFID in the past did not achieve its expected impact was due to weaknesses in these linkages rather than any intrinsic lack of utility of the research itself.

A good example of this is the research on genetic resources of agroforestry species funded by DFID's Forestry Research Programme (FRP) in the late 1980s. The perceived lack of impact of this research led DFID (and other donors) to move away from funding this area, despite the fact that selection and use of appropriate and well-adapted germplasm shows large yield increases and remains a central tenet of tree domestication for agroforestry. With hindsight it is clear that this research would have had greater impact if attention had been paid to the whole promotion pathway (eg seed supply mechanisms, training of extensionists, etc.) as well as the research itself. More recent FRP-funded research at OFI (eg tree fodder for smallholder farmers in Africa) has included a strong dissemination component, and this has very greatly increased the adoption and impact of the technology.

The lesson from this is that science can only effectively support international development if the promotion of the results is given at least as much emphasis and support as their generation. Such benefits inevitably require a lead in time for the generation of technical information. Effective solution of constraints that uses research and promotion pathways is, however, rarely suited to the short term funding of projects favoured by donors.

The impact of scientific research can be greatly enhanced by small, well-focused inputs such as the training of staff from NGOs and community-based organisations working directly with farmers.

5. *The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes.*

Increasingly DFID's country level programmes assume that the technical solutions to issues are resolved and that policy and governance are the only factors limiting progress. In some cases donors have linked the release of broader aid packages to the development and implementation of sustainable forest management, with little attempt to establish whether the technical capacity exists to implement such a process. The implementation of sound policy requires the existence of sound, reliable, technical information and ability to distinguish between the sound and unsound.

The importance of past research, and research records

DFID has continuously funded over 40 years of research in various areas of natural resources. Much of this past research has the potential to be of continuing value in its target countries. Indeed archival material is essential to long term monitoring of natural resources. However, in many cases the records in those countries are lost or inaccessible. Archive material often still exists in UK institutions, such as OFI, but it is very difficult for developing country partners to access, in the absence of any organised system of data archive management. In addition the re-alignment of DFID's research priorities, and the resulting break-up of research teams (see 4.1 above), threatens the survival of much of the archive material still in existence.

Recommendation: DFID should add value to its huge investment in research to date by supporting the maintenance and access to data archive management systems.

6. *The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

Development and maintenance of research capability in developing countries

Many of the brightest scientists in developing countries have been trained in the UK with DFID or British Council funding. As an example of the extent of this training, over 1,000 have been trained to PhD (96 from 27 countries), MSc (318 from 40 countries), or professional short course level (616 from 75 countries) at OFI since 1985. Important training has also been provided by UK funded personnel directly in developing countries. These professionals currently occupy a range of positions in research, training, policy development and implementation. In addition, many UK (and latterly EU) nationals have been trained and similarly play key roles in research, training and policy development and implementation within a wide range of organisations (government, private, NGOs, charities, etc.) involved with development.

As examples, UK trained scientists have played significant roles in the development of technical bases for agroforestry systems that facilitate added value marketing of export crops such as coffee and cocoa (organic, fair-trade, etc), sustainable forest management, certification processes for sustainable forest management, carbon sequestration and credits.

However, few national agricultural/forestry research institutions (NARS, NFRS) in developing countries have sufficient funding from their own governments to function effectively; and as donor funding for agricultural and forestry research dwindles, the staff, however well trained, can quickly become unable to conduct useful research because of lack of operational funds. Under the influence (either intentional or unintentional) of development agencies, funding for research in such institutions has often followed the policy shifts of donors, resulting in a comparable decrease in local funds for technical research.

In addition factors such as civil conflict, HIV/AIDS are having serious impacts on research and technical capacity in some countries. The past assumption that sufficient research capacity will result from training a few people per country, on a one-off basis, that will then be self sustaining within the country, is not valid. Only in a few countries (eg India, Costa Rica) has the level of input been sufficient to reach a self sustainable scientific capacity within the areas of natural resources.

November 2003

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APPENDIX 17

**Memorandum from the London School of Hygiene and Tropical Medicine**

1. *The coordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and objectives of HM Treasury, DTI, OST, FCO, British Council and DFID*

Apparently only weak coordination mechanisms exist across Government for research underpinning development, although some, such as DFID interaction with MRC, have been mutually beneficial in the health field. At present no UK research policy forum exists that is open to participation by both government and non-government members where there could be dialogue about research priorities. Development would be a suitable topic for a major cross Research Council initiative.

*2. The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

Internationally DFID has been widely seen as a highly effective bilateral donor agency that makes excellent use of the scientific evidence coming from its Knowledge Programmes in formulating policies, particularly in health. We are concerned that the recent reorganisation of DFID should not weaken these established mechanisms for knowledge utilization and use of scientific expertise. DFID could also benefit from the wider range of scientific expertise that exists in UK outside of the Knowledge Programmes by making more use of scientific advisory committees and by greater involvement of academic staff as technical advisers in selected official meetings in the UK and internationally.

*3. The extent to which investment in research and the promotion of innovation play a part in DFID's country level programmes*

We believe that investment in research, capacity building for research and promoting the use of research findings occurs relatively little in DFID's country level programmes. However only formal study of the extent to which research features in country level programmes would confirm or refute our impression. The uncritical acceptance of innovation without evidence of effectiveness may not be beneficial. What is needed for public health is the promotion of policies and practices based on sound research evidence where this is available and the commissioning of research to address gaps in knowledge particularly in areas of health services and systems and in public health, where DFID plays a key role as a research finder. In general, funding of primary research is probably best undertaken centrally but DFID country level programmes can play an important role in ensuring that researchers from low income countries participate in multi country research programmes, particularly large scale intervention trials. These can provide an excellent opportunity for capacity building and developing South-South links as well as promoting uptake of research findings where interventions are found to be cost effective.

The management of research and research capacity development aid at country level is labour-intensive and most country-level DFID staff lack the time to manage them, while their senior programme managers may not see this as a priority. Existing DFID Research Programmes are well placed to play a significant role in assisting with this, and various models of how this might be done are available.

Many country level DFID staff have no training in research and thus could benefit from an induction programme and/or continuing professional development programmes delivered through distance learning. Such programmes could sensitize staff to the contribution that research can make to development and public health. They could also assist them to critically appraise research evidence and promote its use where appropriate.

*4. The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the coordination of these efforts with NGOs, charities and international programmes*

Apart from patented drugs, vaccines and some diagnostic technologies, most public health knowledge is seen as a public good and can be freely transferred to developing countries. Greater support is needed to assist developing countries to build their own capacity to develop drugs, particularly in the case of neglected diseases affecting predominantly poor populations for which pharmaceutical companies may have little interest in investing because the market is unlikely to provide adequate returns. The interaction of DFID, International Agencies (especially the World Health Organisation), academics in the UK and elsewhere and pharmaceutical companies has improved the climate for dealing with these diseases but much more can be done by continuing collaboration of all these groups. Capacity to field test and adapt robust and portable diagnostic technologies is also needed within low income countries.

*5. The ways in which the UK private sector and public-private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced*

Most international partnerships focus on global fund raising for the further development of new technologies, such as drugs and diagnostics, and thus they involve mainly global players, such as multilateral and bilateral donors, foundations and multinational companies. However, in general partnerships have weak inputs from the end product users in developing countries including from policy makers and programme managers. Private sector investments in research for developing countries are strongly supply driven and not demand led. Greater public investment by DFID in country led research priorities would help to correct this imbalance. Public private partnerships can promote knowledge transfer such as a Unilever funded partnership based at the School promoting hand washing in India. Other areas where public private partnerships can be effective include vaccine development and trials and drug development for neglected diseases. Research [at the School] is identifying the key aspects of such partnerships.

6. *The extent of scientific and engineering training provided by the UK as a part of development policy and the subsequent utilisation of such training in developing countries*

Low availability of research funds and under funding of universities in many DCs, combined with a low priority for research capacity strengthening by DFID and most other bilateral donors, makes it difficult for high level scientific training to be fully utilised in many DCs. In addition, health and medical research organisations in DCs tend to be poorly funded and weak. Capacity building, both to enable low income countries to undertake essential health research and to make better use of research findings, should be given greater prominence in DFID country level programmes. DFID research programmes in the UK, given adequate resources, could be a cost-effective way to help build such capacity. Capacity strengthening requires much better funding support and long term commitment, especially from DFID offices in countries. However, the UK Research Assessment Exercise (RAE) focuses only on research achievements and gives no credit for policy transfer or capacity strengthening activities. The present HEFCE funding arrangements linked to the RAE act as disincentives for Higher Education Institutions to be involved in capacity transfer and institutional strengthening. The Roberts review of the RAE provides an opportunity to influence the conduct of the next exercise which is likely to be in 2007.

The School is helping to develop capacity in research, policy and practice through its extensive postgraduate education programmes but with current resources the ability to directly support academic institutions in low income countries is very limited. One approach which has proved successful on a small scale is permitting the use of our distance learning materials under licence to support face to face postgraduate education in South Africa. Demand for distance learning is growing rapidly and has the twin advantages of reduced cost and avoiding lengthy absences from the country in question, but for research degree students direct contact with supervisors is still necessary. Expansion of UK scholarship funds for distance and mixed mode learning (ie a mix of distance and face to face learning) could encourage more rapid capacity strengthening in a cost effective manner and could encourage retention of trained staff in low income country universities by reducing isolation and improving morale.

Institutions like the School could play a much more active role if appropriate policies, funds and other incentives were in place.

November 2003

Annex

BRIEF BACKGROUND ON THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

*Mission Statement*

“The mission of the London School of Hygiene and Tropical Medicine is to contribute to the improvement of health worldwide through the pursuit of excellence in research, postgraduate teaching, advanced training and consultancy in international public health and tropical medicine.”

*Background*

The School celebrated its centenary in 1999 as a leading international school of public health and today it has over 10,000 Alumni in over 160 countries. In 2003 in full time equivalents there were 218 academic and 183 research staff; and 565 Masters and 329 research degree (PhD/DrPH) postgraduate students. Over 41% of these students came from Overseas, 25% were medical graduates and 65% were female. The School therefore provides a remarkable international environment for advanced students to interact. In addition, there were 1,200 and 641 people registered on distance learning and short courses respectively.

The School is a leading UK postgraduate institution that covers a wide range of laboratory, clinical and population sciences and is the largest school of public health in Europe. It undertakes a range of research directed at improving public health in both developing and developed countries. The School's research excellence was confirmed by being awarded two Grade 5s in the RAE in 2001 Research Assessment Exercise. The School's total income in 2002–03 was £53.4 million, with £33.2 million or 62% coming from research grants and contracts, of which £9.1 million was from the UK Government, £7 million from UK charities and £5.1 million from research councils. Only 19% of total income was from HEFCE grants.

*School's contribution to scientific knowledge generation, dissemination and use*

DFID supports seven Knowledge Programmes at the School focusing on science in developing countries which cover: Malaria; Tuberculosis; Sexual and Reproductive Health Policy and Practice; HIV, AIDS and Sexually Transmitted Infections; Effective Policies and Services for Safe Motherhood; Health Economics and Financing; and Health Systems Development.

The School also collaborates closely with a wide range of scientific institutions in developing countries, particularly in Sub-Sahara Africa and Asia. In addition, it also has an extensive role in the global dissemination of scientific knowledge and in identifying the scientific lessons and best practice for health



interventions. It is closely involved in policy formation at the international level through its research programmes, advisory role and consultancy activities. It maintains close policy links with DFID and global partnerships, as well as the World Health Organisation, World Bank and other UN agencies.

*School support for scientific and development objectives*

The School strongly supports the aim of development being directed to poverty reduction for the most needy populations in DCs and the focus on achieving the Millennium Development Goals (MDGs). However, the process of attaining them in a sustainable way requires a longer term perspective than is sometimes acknowledged.

However, this development focus should not be to the exclusion of support for the more basic and applied research needed earlier in the “pipeline” for product and programme development. In particular this applies for research into new interventions and for neglected or “orphaned” diseases, including new drugs and diagnostic technologies. It is rare for a health intervention to pass from the first efficacy trial to operational acceptance in less than a decade, and research workers elsewhere may lose interest in the downstream research needed to complete the process. The focus on poverty reduction needs to be wide and open to investing in evaluating the efficacy, effectiveness and costs of developing health systems. The School is one of the few UK research institutions that has all the scientific disciplines required for large scale controlled trials in developing countries. In addition, the School has all the multidisciplinary expertise required for impact evaluation of public health policies and programmes in DCs.

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## APPENDIX 18

### Memorandum from the International Rice Research Institute

#### WHAT IS THE INTERNATIONAL RICE RESEARCH INSTITUTE?

1. The International Rice Research Institute (IRRI) is an autonomous, nonprofit agricultural research and training organization. Founded in 1960, it has its headquarters at Los Baos, some 65 kilometre south of Manila in the Philippines. The institute’s main goal is to find sustainable ways to improve the well-being of present and future generations of poor rice farmers and consumers while at the same time protecting the environment.

2. IRRI is part of the Consultative Group on International Agricultural Research (CGIAR). The United Kingdom became a member of CGIAR in 1971 as one of the group’s 16 original investors. Official support from the United Kingdom to the CGIAR is administered through its Department for International Development (DFID).

#### *The importance of scientific research on rice to the UN Millennium Development Goals*

3. Today, rice research is as important as ever to development because it helps those in greatest need of assistance: poor people with limited access to food. With ongoing support, IRRI’s research can continue to help an enormous range and number of people. First and foremost are those whose lives are directly improved by better and cheaper rice:

- Hundreds of millions of landless and urban poor who spend a large proportion of their income—20–40% in some areas—on rice;
- Millions of poor rice farmers, farm workers and their families, for whom reduced production costs and increased rice yields can make a huge difference in quality of life;
- Hundreds of millions of women who play a key role in farming rice and who are responsible for their families’ food needs; and
- Hundreds of millions of children whose education is interrupted so that they can labour on rice farms and whose health is compromised by lack of food security.

4. Two of the eight UN Millennium Development Goals (MDGs) are integrally linked to continued and strengthened research efforts to help farmers grow rice more efficiently, profitably and sustainably:

#### *MDG 1—eradicating extreme poverty and hunger*

Many rice consumers and producers are among the poorest and the most deprived of access to food. Reducing the cost of rice and improving the profitability of rice production through better farming techniques and higher yields is a major step in reducing poverty. The increase in rice production driven by the Green Revolution in Asia reduced the incidence of hunger from 33% in most Asian developing countries to 18% as it halved poverty.

*MDG 7—ensuring environmental sustainability*

Research to improve rice farming represents both an acute need and a great opportunity to ensure environmental sustainability. Rice occupies more farmland in Asia than any other food crop—60% or more of total cropped area in the poorest countries. Even limited progress toward cleaner and greener rice farming can bring significant benefits.

5. Rice research directly advances four others MDGs:

*MDG 2—achieving universal primary education*

Asia's poorest spend 20–40% of their income on rice. Cheaper rice and improved rice farming efficiency and profitability will leave more money and time for children's education.

*MDG 3—promoting gender equality and empowering women*

Women traditionally play a major role in rice farming. As men increasingly leave the farm to try to earn money elsewhere, women shoulder even more responsibility. Again, increased rice farming efficiency and profitability have a potentially large and positive impact.

*MDG 4—reducing child mortality, and MDG 5—improving maternal health*

Both of these goals can be advanced through continuing research into the new field of biofortification, or breeding new rice varieties with increased micronutrient content. Iron, zinc and vitamin A deficiency afflict hundreds of millions, if not billions, across the developing world. These deficiencies cause irreversible blindness, anaemia, reduced productivity and even death. In partnership with other members of the CGIAR, IRRI is developing nutritionally enhanced rice varieties that will contribute to eliminating these problems.

*What has IRRI achieved?*

6. Throughout its history, IRRI's research has directly and indirectly alleviated poverty, provided food security and reduced malnutrition among poor rice farmers and consumers—a group that makes up about half the world's population.

7. IRRI developed the first semidwarf breeding lines for rice in the mid-1960s. High yields and rapid farmer adoption of the new grain varieties triggered the Green Revolution. National agricultural programs worked in cooperation with IRRI to intensify rice production. The IRRI rice varieties were soon followed by dozens, then hundreds, of semidwarfs developed by scientists in national programs.

8. Over the years, scientists have been able to incorporate into successive modern varieties ever-stronger resistance to insect pests and diseases. This has not only helped to reduce farmers' dependence on harmful agrochemicals but also reduced costs and thus boosted incomes. Scientists have also bred varieties that mature early and so save land area through multiple cropping; that have improved grain quality and so allow farmers to obtain better prices; and that tolerate drought, submergence and poor soils and so allow farmers to maintain yields even under difficult conditions.

9. These and other technological advances have changed the face of rice cultivation in humid and subhumid Asia over the last 40 years. Rice production in Asia grew from 240 million tons in 1966 to about 530 million tons in 1999, much more quickly than the regional population, which has almost doubled over the past 35 years.

*Capacity building through research-driven innovation*

10. With donor support, technical innovation—promoted and sustained through well managed, appropriate research—will continue to foster development and build capacity in developing countries.

11. One of the key capacity builders in IRRI projects is collaboration with the national agricultural research and extension systems (NARES) of rice-growing countries. These relationships strengthen rice research capacity and help develop and disseminate new rice technologies and farming practices.

12. IRRI currently has a collaborative relationship with most Asian countries and maintains, in addition to its headquarters in the Philippines, country offices in 10 of them: Bangladesh, Cambodia, China, India, Indonesia, South Korea, Laos, Myanmar, Thailand, and Vietnam. These host countries serve as IRRI partners in developing technologies for rice-based farming systems in the major rice-growing environments.

13. IRRI's role in strengthening the NARES includes:

- Providing national systems with rice science technologies that are ready to be adopted and/or can be adapted to specific environments;
- Helping NARES refine such technologies through applied research;

- Assistance in delivering the new technologies; and
- Helping NARES attract their own research funds.

14. Since 1963, IRRI's training program has provided more than 15,000 training opportunities for NARES scientists. In Asia, every national institute with responsibility for rice-related research has at least one IRRI-trained staff member.

15. Furthermore, IRRI has initiated and taken a lead role in various networks and initiatives such as the International Network for Genetic Evaluation of Rice (INGER), the Crop and Resource Management Network, the International Network on Soil Fertility and Sustainable Rice Farming, and the International Rice Genebank. Undertaken in collaboration with the NARES to exchange germplasm, information and knowledge, these networks have helped develop knowledge and transfer technology across national boundaries. For example, approximately 75% of all rice crosses and varieties released from IRRI and the NARES have come from INGER. With their enhanced capacities, the NARES themselves are increasingly taking the lead in making crosses and producing varieties.

#### *DFID-funded IRRI projects and support from UK science*

16. DFID has collaborated, and continues to collaborate, with IRRI on many fronts. IRRI has research contacts with many DFID-funded projects and programs, and with institutes throughout the UK, including:

- The DFID Plant Science and Crop Protection Programs;
- The Universities of Aberdeen, Birmingham, Liverpool, Newcastle, Reading, and Wales-Bangor, among others;
- The John Innes Centre; and
- The Natural Resources Institute.

17. IRRI projects directly funded by DFID have made, and continue to make, profound contributions to food security and poverty alleviation in Asia. The following two examples illustrate the close link between UK science support and development.

#### *Poverty Elimination Through Rice Research Assistance (PETRRA)*

18. Set up to help Bangladesh become self-sufficient in rice production, the PETRRA project is managed by IRRI in close partnership with the Bangladesh Rice Research Institute and the Bangladesh Ministry of Agriculture. Key to its success is consultation with the rice farmers themselves, to find out what they need to help them improve their lives. PETRRA's main goal is to achieve further substantial increases in domestic rice production and incomes by 2008, and so make a major contribution toward a 50% reduction in rural and urban poverty by 2015—the UN Millennium Development Goal to which the government of Bangladesh has committed itself.

19. This effectively means lifting 26 million people out of poverty over the next dozen years. To achieve this, PETRRA focuses on four key outputs:

- New rice-production technologies for resource-poor farm households;
- Improved capacity for demand-led research in the national agricultural research system;
- Greater recognition of, and promotion of dialogue on, key policy issues; and
- Improved methods for the effective uptake of new technologies.

#### *Natural resource management for rainfed lowland and upland rice ecosystems*

20. The farm families who live and work in rainfed lowland and upland rice areas are among the poorest people in Asia. These less-favorable ecosystems tend to produce low and unstable rice yields. Risk caused by erratic water supplies, crop diseases and pests, and problem soils discourage farmers from investing in alternative rice-production and resource-management technologies. Unsustainable farm practices can degrade the natural resource base and send farmers ever deeper into poverty. Many inhabitants of these areas, especially the uplands, belong to ethnic minorities that are often socially and politically disadvantaged.

21. In partnership with the NARES, farmers and other stakeholders, this project concentrates on developing and evaluating improved crop and natural resource management through improving factors such as seed health, integrated pest management, and nutrient and weed management.

22. The project employs a participatory approach, driven by local needs and leading to readily adopted sustainable results. For example, in Bangladesh in 2002, the project increased farmers' awareness that using clean seeds—a simple, easily managed intervention—can fortify crops against disease and boost yields by 12–14%. To ensure long-term success, project staff collaboratively established seed-selection procedures and trained key farmers, and are now assessing the quality of harvested seed.

23. DFID's support for this research is part of its core funding contribution to the institute's budget.

#### *Perspectives*

24. Technical investment in agriculture has traditionally yielded large returns. This will continue as long as support and funding are available. In science, progress is made through the steady accumulation of knowledge, skills, innovation and expertise. Agricultural research for development is no exception, and it must have the opportunity to continue to build on the useful work already done.

25. While good policy formulation is essential to development and poverty alleviation, research-driven technical assistance remains a key element in both the short and long term. Well-placed, timely research and training will build developing countries' capacities and enable them to reach sustainable self-sufficiency.

26. Support from the UK, and from UK institutions and scientists, is a key component in the agenda to realize a secure and developed world.

November 2003

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## APPENDIX 19

### Memorandum from Dr Sir Clive Elliott

I am a Senior Officer in the Locust and Other Migratory Pests Group, Plant Protection Service AGPP, at the headquarters of the Food and Agriculture Organization of the United Nations (FAO) in Rome.

Unfortunately in 2001, DFID, following a very cursory evaluation, decided, after 50 years of British involvement in Desert Locust management, that further support of Desert Locust research and development was no longer a priority. The main reason given was that, although studies showed that the poorest farmers suffered the most when locust attacks occurred, such attacks did not occur often enough to justify any inputs. The implication was that if a major upsurge in Desert Locust populations leading to a plague occurred, the UK would provide assistance with emergency aid. The fact that emergency aid would be likely to cost far more than the support of research and development towards making preventive control a sustainable reality, was ignored. As a result, the UK is no longer contributing to FAOs EMPRES Programme that aims to develop sustainable preventive control of the Desert Locust. When FAO can find the funds, it continues to contract individual British scientists.

As a British citizen and tax payer, it seems to me to be an irresponsible use of Government funding to pay probably 1,000 times more to help with locust emergencies, than to support the much lower costs of supporting British scientific expertise towards developing sustainable preventive control.

A reconsideration of the British Government's position on preventive control of the Desert Locust is needed. In the past, some of the assistance provided has been used for the self-serving interests of British institutes and universities. If new support is made available, it should be coordinated with FAO and driven by the needs of the national locust units in the locust-affected countries and their efforts to serve the smallholder farmers in Africa, the Near East and South-West Asia including India and Pakistan.

By way of background, it should be mentioned that the British Government has a long tradition of assisting with the problems created by the Desert Locust *Schistocerca gregaria*, the famous species that was one of the eight plagues of Egypt mentioned in the Bible and which, in full plague can threaten agriculture in about 65 countries in the world covering 20% of the Earth's land mass. Up to 1951, global coordination of Desert Locust management was based at the Centre for Overseas Pest Research (COPR) in London. Thereafter this role was transferred to FAO. Nevertheless British support for locust activities remained strong and British scientists, especially those from the Natural Resources Institute (NRI, which replaced COPR), conducted important influential research into methods for preventing locust plagues.

During the Desert Locust plague of 1986–89, the international donor community, including the UK, contributed over US\$ 300 million to the cost of control operations and locust-affected countries contributed a similar amount. Further upsurges (the stage before a full plague develops) in 1992–94 continued to cost the donors tens of millions of dollars. In 1994, FAO decided to launch a new initiative to try to find a solution to the astronomic costs caused by the Desert Locust problem. FAO called this initiative EMPRES (Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases—Desert Locust component). EMPRES was planned as a long-term effort (three phases of four years each) to try to establish sustainable preventive control of the Desert Locust, such that the risk of plagues would be reduced to a minimum, costs of preventive control would be reduced, and side-effects on human health and the environment would also be minimized.

The British Government, through its Ministry of Overseas Development, later DFID, participated in the process of creating EMPRES, usually by funding scientists from NRI to be present in meetings. When EMPRES was launched in 1997 in one of the three affected regions as a multi-donor field programme, the UK participated bilaterally. The main UK contributions were made in developing a locust data management and decision-making system RAMSES which connected to another Geographic Information System at FAO HQ called SWARMS, and in training locust staff. The two systems gradually brought a profound improvement to the process of managing locust data both at the field level and as an aid to the coordination process at FAO, but this contribution was only realized after DFID discontinued its support. The training inputs slowly evolved into the creation of national capacities for training, which were intended to become sustainable. DFID funded a substantial part of the development costs of these improvements, but others had to be paid for through contracts funded by FAO with NRI staff. Compared to other donors such as the Netherlands, Germany, and the United States, the UK support for EMPRES was relatively meagre.

It should be noted that currently the Desert Locust is on the move again. Initial outbreaks have occurred in Mauritania, Mali, Niger and Sudan. The rainfall that occurs in the next few months will influence whether the Desert Locust population continues to grow until it reaches plague proportions. It is exactly now that the EMPRES Programme needs to perform if it is to contain the present situation, even though the programme has not completed its development cycle in all the regions affected. The contribution of British scientists funded by DFID to improve EMPRES in this severe test would be invaluable. Help is needed in identifying the lessons to be learnt so that EMPRES grows more effective, and the burden of costs is lightened for locust-affected and donor countries alike.

*November 2003*

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## APPENDIX 20

### Memorandum from the Silsoe Research Institute

Silsoe Research Institute has supported DFID and its predecessors, notably ODA for over 40 years, in agricultural engineering technology and science through UK Government research and development via both centrally funded and in-country bilateral activities. This has included research to improve agricultural productivity, improve rural livelihoods and reduce poverty:

- Through the more efficient use of natural resources, notably soil and water conservation, crop establishment and weed management;
- Through better availability and use of farm power, particularly draught animals, and increasing labour productivity; and
- Supported by strong socio-economic input.

Our recent work has included collaboration with many national research and development institutions, CGIAR centres and NGOs, often funded by DFID. This has concentrated mainly on Latin America and Sub-Saharan Africa. We have recently made submissions to DFID in support of their new research strategy arguing strongly that agriculture has a major role to play in poverty elimination and should receive increased investment.

Our work has delivered real in-country and regional benefit in terms of:

- Improving food security and increasing productivity in marginal environments (particularly hillsides and semi-arid areas), involving conservation agriculture through the use of live-barriers, cover crops, reduced and zero tillage techniques;
- Improving the use of chemicals for pest, disease and weed control through more effective and reduced application with reduced health hazards;
- Development and use of participatory methodologies for problem identification, technology development and promoting scaling-up; and
- Enhancing in-country capacity and institutional change at researcher, development agent and policy maker levels, through workshops, conferences, training programmes and communication development.

We have made these contributions through our research base which includes both scientists doing high quality physical and engineering science, and also scientists who understand the context and opportunities in developing countries. Unfortunately over the past decade there has been a major decline in resources available to ensure appropriate use of this knowledge for poverty reduction and livelihood improvements. As a result we now have few research scientists who are actively involved in work for the benefit of developing countries, and limited resources available to build the high quality scientific partnerships that are crucial to solving development problems and to capacity building in developing countries. This decline is also reducing the opportunity to leverage other international funding sources, including the EC. This erosion of research capacity will inevitably lead to fewer opportunities for UK dialogue with developing countries at all levels and for influence on the international development agenda.

We believe that past DFID investments in support of Agriculture and the Natural Resources Sector have provided strategic opportunities to use scientific and technical outputs to influence the DFID development agenda. These opportunities are now being missed. We believe that there is a real need to sustain and build upon UK expertise in science and technology to support developing countries. Continued priorities exist to help the developing world obtain full advantage from technology advances and to avoid environmental disasters that can readily follow from poor management of the productive capacity of the land. The UK science base is strong in these areas, and steps to facilitate effective use of these resources are needed.

November 2003

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## APPENDIX 21

### **Memorandum from Professor Michael Roberts, DEFRA's Central Science Laboratory**

1. As Chief Executive of Defra's Central Science Laboratory, I wish to provide an input to the Committee's inquiry into the use of science, technology and engineering in UK international development policy. CSL provides research, technology and innovation to inform Defra's sustainable development policy. CSL specialises in the sciences that underpin sustainable agriculture, safe food and a healthy environment. This capacity has been used to some degree in building a relevant science base in developing countries. The CSL response to the specific points raised by the Committee are as follows:

*2. The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

2.1 CSL receives support from DFID through the Crop Protection Programme (CPP) to implement research and development, technical back-stopping and capacity building in developing countries. The outputs generated underpin sustainable agricultural development aimed at reducing poverty in smallholder farming families. CSL is also engaged by DFID in training scientists from developing countries in release and environmental monitoring of GM crops. CSL's expertise in carrying out activities of this kind is due to its capacity developed through funding from DEFRA and other government departments as research activities and technologies are closely linked.

2.2 This capacity provides expertise that can be utilised in supporting government international development policy. The convergence of the policy framework of Defra and DFID on sustainable development since 2001, should provide opportunities for greater synergy in sustaining science capacity in the future.

*3. The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

3.1 DFID acquires and uses scientific advice from several sources. In the current Renewable Natural Resources Research Strategy that is implemented by the 11 Research Programmes, each programme has an advisory committee with UK and international experts in the natural and social sciences. At CSL, Dr Nicola Spence is an adviser to the DFID CPP. Based on CSL's experience with other government departments, DFID could access more scientific advice by seconding scientists for short periods into DFID for specific tasks.

*4. The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes*

4.1 Meeting the market demands of exporting fresh produce to Europe are very challenging for developing countries as they have to comply with maximum residue limits (MRL's) for pesticides traceability of produce from each farm and quality assurance to meet accreditation schemes such as EUREPGAP. Production of fruit and vegetables are very important to developing countries as they provide health benefits and opportunities for economic development. In Kenya total horticultural production is 3.5 million tonnes per annum, of this 140K tonnes are exported annually with a value of \$300M. Up to two million people are directly or indirectly engaged in horticulture so it represents an important source of employment and as 50–60% of export farmers are smallholder farmers there are real opportunities to impact on poverty. However, there are serious threats to horticultural production in countries such as:

*Pests and disease*

- Lack of Pest & Disease resistance in varieties
- Resistance to pesticides due to inappropriate use
- Mycotoxin contamination of foodstuffs

*Pesticide use*

- Pesticide import costs can be prohibitive
- Biopesticides represent a small fraction of the pesticide market
- Human and environmental safety issues

*Quality requirements*

- Accreditation
- Market share
- Competition
- Ethical trading
- Food miles
- Homeland Security

4.2 Progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions is critical to success. For example a new biovar of bacterial wilt in Pelargonium propagation nurseries in Kenya threatened trade with the USA, a world expert on this pathogen from CSL (Dr John Elphinstone) has been called in by the plant health regulators in Kenya (KEPHIS) to assist in solving this problem. His capacity to respond is because of his enormous experience in plant health issues gained when developing policy for DEFRA, the EU and increasingly the USA.

*5. The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced*

5.1 In the UK the LINK programme has been very successful in leveraging private sector support for public good research. DFID has had its own Business Link Challenge Programme to stimulate public-private partnerships but this could be further promoted and strengthened. Stimulating entrepreneurs and successful businesses in developing countries underpinned by technology transfer from the public sector is key to economic development.

*6. The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

6.1 UK Institutes and Universities train many students from developing countries to MSc. and PhD level. CSL does this but also provides supports and trains experts and policy makers so that institutional capacity develops and becomes sustainable. For example, the Plant Health Group CSL has been involved in training and capacity building in Plant Health inspection services in several countries (eg KEPHIS) to assist these services in responding to new problems or trade barriers.

7. In summary, CSL science is contributing on a limited basis to the long-term prosperity of developing countries by helping them to develop a scientific capacity. In addition, technology transfer in risk management and institutional infrastructure is a key factor in promoting sustainable development.

November 2003

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## APPENDIX 22

### Memorandum from Dr R B Matthews

1. I am a Reader in Biosystems Modelling at Cranfield University at Silsoe, Bedfordshire, where I teach modelling of environmental and hydrological systems, and carry out research. Previously I also taught agronomy and plant science before these courses were terminated due to declining student numbers. Most of my research has been on tropical agricultural systems, ranging from semi-arid systems in India, agroforestry systems in Zambia, rice production systems in Asia, tea plantations in East Africa, and soil fertility in Nepal,

covering themes such as drought resistance, low external-input agriculture, carbon sequestration, climate change, methane emissions, nitrogen fixation, and sustainability of cropping systems. I have some 113 scientific publications in these areas.

2. I wish to emphasise that the following comments are entirely my own, and do not necessarily represent the views of my employer, Cranfield University.

#### GENERAL COMMENTS

3. There has been a serious decline within the UK in funding for overseas natural resources research in recent years, so much so that soon (if not already) there will not be sufficient critical mass of researchers to ensure that the UK has any credible expertise in tropical and developing country issues. This is underlined by the recent closure of the Oxford Forestry Institute, the large redundancies at the Natural Resources Institute, and the loss or decline of expertise in tropical agriculture at the University of Nottingham, the University of Wales at Bangor, Reading University, the University of Newcastle, Edinburgh University, and Cranfield University's Silsoe College, to name a few. There is currently no incentive for bright graduates to choose to make a career in tropical agricultural or environmental research, as there are no opportunities within the UK awaiting them when they complete their studies. This is indeed a sorry state of affairs for a country that, historically, has made a huge contribution throughout the world in this area, particularly at a time when the need to improve food production at low cost has never been greater, and when the resources for the global community to work together on common problems have never been so readily available.

#### SPECIFIC COMMENTS

*The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

4. There appears at the moment to be a major gap within the UK in funding opportunities for basic environmental and ecological research outside the UK, particularly in tropical regions. Most of the work funded by NERC is on issues related to the UK, and DFID no longer has an Environmental Research Programme. Where then should a researcher interested in fundamental environmental or ecological research in tropical regions (eg on resilience of ecosystems to outside perturbations, or the effect of sulphate deposition from acid rain on methane emissions from rice fields) turn to for financial support? Either NERC needs to broaden its mandate to include problems beyond those directly related to the UK, or DFID needs to reinstate its Environmental Research Programme with substantial financial commitment to it.

*The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

5. Serious thought needs to be given within DFID to the process whereby scientific knowledge is (a) generated, (b) applied, and (c) disseminated. Under the current Renewable Natural Resources Research Strategy (RNRRS 1996–2005), these phases have occurred more-or-less sequentially, with much fundamental technical research being done in the first years of the RNRRS, followed by a swing towards socio-economic methodologies with a view to application of the technical knowledge generated, followed finally by a dissemination phase in the last two to three years of the ten-year strategy. While all three phases are equally important in addressing poverty issues, researchers' specialities and expertise rarely encompass all three, with the effect that there is a serious discontinuity in the process. Fundamental researchers, for example, have a period of activity in the early years, after which their funding dries up as it is switched towards those specialising in research applications. Thus, their interests move away from developing country issues, or worse, their positions are made redundant, in which case, they are forced to find jobs abroad. Either way represents a loss of expertise in tropical issues from the UK. A similar process is experienced by applied researchers and dissemination specialists during their turn in the sequence.

6. The research process, therefore, ideally needs to be made continuous and simultaneous, such that there is constant support for all three groups. Having said this, communication between the three groups does need to be improved, so that fundamental research is informed by problems faced by practitioners, and that practitioners are aware of new research products. This has a major advantage over the current system in that the research process is rarely sequential, and usually involves several iterations between fundamental and applied researchers and disseminators before a new product or technology becomes available. By keeping all three in the loop through support of their activities, rather than losing one or the other through lack of support, the efficiency of the research process will be significantly greater.

7. Another issue in relation to the way that scientific information is used to help guide development and implementation of policies by DFID is the use of modelling. Modelling is an important tool, not only in making explicit the results from research in a form that can be used by non-researchers, but also in integrating results from many different disciplines so that the interactions between all the components of a system can be explored. There is a general appreciation by the Scientific Research Councils now that reductionist research, while having been very successful, cannot answer all questions, and that there is an



urgent need to move towards more integrative approaches, so that individual components are placed in their rightful place in an overall system. The BBSRC, for example, in its recent Strategy document has designated Integrative Biology as one of its core themes, with predictive modelling being an essential tool to achieve this. Similarly, the Rural Economy and Land Use (RELU) joint initiative between BBSRC, NERC and ESRC is a good example of moves in the direction of integrative research—it would be good if DFID could promote a similar initiative in the developing country context. Modelling offers a cost-effective way of linking all these different components, both biophysical and socio-economic, so that their interactions can be investigated, and hypotheses (ie “What if . . .” questions) tested before interventions on the real system are attempted. The Sustainable Livelihoods Framework based on individual households is a useful conceptual model upon which such an integrative approach can be based, but this needs to be made explicit to provide predictive tools. Such tools are a way that research results in individual disciplines can be encapsulated in a form that are useful to policy makers at higher levels; for example, in predicting the likely impacts on individual households and communities of particular policies they are considering making.

8. Unfortunately, in recent years, there has been a disappointingly negative attitude within DFID to modelling in general, and as such there has been little progress in thinking in this direction. This needs to change, so that new tools and approaches emerging in other disciplines, such as artificial intelligence, ecology, and complex systems, for example, are used in addressing DFID’s central themes. Much of this negative attitude may be due to the lack of applications of DFID-funded work on crop modelling in the past, but it should be realised that crops are only one component of complex agricultural systems, and that there is a need to develop models integrating crops, livestock, trees, soil processes (water and nutrients), climate, and of course, people, along with the socio-economic environment within which they live. Some progress has been made in this direction, but this has been slow, as it has been very difficult to obtain financial support for such work, despite much talk about the need to do integrative research.

*November 2003*

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## APPENDIX 23

### Memorandum from the Institution of Civil Engineers

The Appropriate Development Panel of the Institution of Civil Engineers is a cross-sector group and includes representatives from a number of UK Non Governmental Organisations and academic bodies in conjunction with senior members of the ICE, the panel has the following objectives:

- Co-ordinate the contribution of Civil Engineers with those from other disciplines towards the eradication of poverty;
- Promote debate and communicate the key issues in achieving poverty alleviation;
- Promote the exchange of good practice in the use of sustainable technology for the creation and maintenance of infrastructure; and
- Raise the consciousness of engineers and related professionals to their contribution to ethical development.

The Appropriate Development Panel does not have hard evidence to provide definitive answers to the questions posed by the Science and Technology Committee. It does, however, feel competent in making the following points:

- The requirements of the Millennium Development Goals are evidence enough that whatever has been done so far, international development work and aid have failed to make a significant impact;
- The evidence gathering workshops recently concluded with the Department for International Development, aimed at determining high level research aims across the disciplines of health, social and political change, agriculture and engineering, indicated a potential lack of co-ordination between the new Central Research Team and the DFID Country level development programmes which could appear autonomous;
- In assessing high-level themes for DFID sponsorship, there appeared to be enthusiasm for promoting vague academic projects which may have some long-term scientific basis and benefit, but little in the way of immediate technology or engineering solutions and thus are unlikely to have any direct effect on the Millennium Development Goals;
- There appears to be a reluctance for DFID, FCO, DTI etc to link together with each other or representative authorities and local action NGOs, IGOs etc in order to determine precisely where research is needed to provide immediate solutions and immediate benefits;
- One positive outcome from the aforementioned DFID workshops is an acceptance that the essential linkages need to be considered in an integrated context. For example: health depends on access to safe water, water depends on engineering; health depends on education, education on communication, communication on technology; food depends on markets, markets on transportation, transportation on access, access on engineering; health centres need buildings, buildings need energy supplies, all need construction and technology;

- Effective poverty reduction initiatives will depend heavily on the scientific capacity of developing countries both to help develop appropriate poverty strategies and to put them in place and maintain them. There would appear to be little evidence of the UK making significant steps in this direction;
- We are not aware of any evidence that research projects have been analysed to establish what has been successful in making a valuable contribution to poverty reduction, where extended research would pay dividends and, equally, what research has been fruitless and should not be repeated. Indeed there is no evidence of an effort to collate examples of good practice. If something works well information about that project/technology should be available to all, regardless of which government department supported the initiative. Whilst there may be issues of intellectual property rights to be addressed, we feel that the establishment of a database of good practice would be of enormous benefit to all those working to meet the Millennium Development Goals;
- However hackneyed the term “Infrastructure” is now perceived there can be little real progress towards the Millennium Development Goals without tackling infrastructure problems. To this end there are a large number of initiatives from a wide range of UK and International organisations that lack co-ordination. A directory of the work being done by these organisations and agencies, in turn linked to a database of good practice, would avoid duplication of effort and considerably help us all move closer to the achievement of the Millennium Development Goals. Allied to this, more work needs to be done to establish ways of assessing the relative importance of different infrastructure services for example, who benefits, who loses out? However there must be a way of controlling this process to ensure that difficult problems impacting on the most vulnerable sectors are not ignored in favour of those problems easiest to reach merely to achieve targets;
- There is a need to review how technology can be used in infrastructure services to strengthen the poverty dimensions set out in the World Bank strategy, as described in its World Development Report 2000–01. This strategy has four elements: Opportunity—financial capital, Capability—human capital, Security—physical capital, Empowerment—social capital. These elements must be considered the cement that hold together the various aspects of infrastructure development;
- It is important to consider that access to infrastructure/services is as important as provision, both in terms of actual access (eg for those with physical impairment) and at a policy level (eg ongoing local issues surrounding security of tenure, land and water rights can often impede). Access to “good services to all” is in the opinion of the Panel preferable to “excellent quality for a select few”;
- Any evidence of real benefit to poor people through the process of privatisation of services should be produced. In addition where public/private partnerships are to be forged is that due to companies truly developing an ethos of Corporate Social Responsibility? or is it “Green-washing” in order to avert criticism/attention from less commendable actions?; and
- The ICE has worked with indigenous professional engineering institutions in a number of countries in order to develop those institutions capacity to set and uphold engineering standards, the aim being that these become strong qualifying bodies for the profession, thereby increasing their capacity in engineering and technological skills. Funding for this project was received from DFID.

The Appropriate Development Panel of the Institution of Civil Engineers hopes that the Science and Technology Committee receive the above observations in the constructive manner in which they have been developed and submitted.

*November 2003*

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## APPENDIX 24

### **Memorandum from the Environment Group, Institute of Development Studies (IDS), University of Sussex**

1. Established in 1966, IDS is one of the world’s leading centres for the latest thinking on development. Over the last decade, members of the Group have undertaken an extensive body of research on science, technology and development policy issues frequently in partnership with a wide range of research bodies, government departments and civil society organizations based in both developed and developing countries. This work has thus enabled us to engage with a broad range of interests and policy-makers working on scientific and technical issues concerning, for example, health, forests, biotechnology, climate change, water and land degradation, much of it in the context of globalisation and broader issues relating to development policy. Our evidence attempts to distil insights from this work of relevance to the Committee’s current remit, focusing on what we have learnt about the significance of institutional arrangements and policy processes in science, technology and development.

2. Science and technology in areas such as biotechnology, agriculture and medicine appear to promise major development transformations central to achieving poverty reduction and specifically the Millennium Development Goals (eg one, four, six and seven) which now guide UK development policy. Yet the gap

between expectations and achievements on the ground is vast. In many instances, scientific and technological advances and investments appear to be widening knowledge gaps across political and geographical boundaries, while failing to meet poor people's needs.

3. Our research has shown that socio-political contexts and institutional arrangements are key in shaping whether S and T investments respond to the needs of poor people in poor countries, whether they can benefit from available technologies, and whether developing countries acquire the capacity to respond actively and innovatively to the challenges of scientific and technological advance. This evidence underscores the need for greater attention to the role of institutions—understood broadly as “the rules of the game”, including both informal norms as well as more formalised arrangements—surrounding science and technology investments and applications in order to foster pro-poor innovation systems. It outlines some of the key dimensions that should be taken into account. These include issues of (a) the framing of science and technology agendas—and whose perspectives, problems and priorities they respond to; (b) access and control, and (c) regulation and accountability. Attention to such institutional dimensions is, we suggest, crucial—and provides an integrating perspective—across many of the specific points on which the Committee is inviting evidence: it should guide approaches to the uptake and integration of scientific research into development policy; to investment in and promotion of research within DFID's country-level programmes, and to training and capacity building in developing countries.

4. The institutional issues to which we draw attention below have, to date, been much underplayed in UK-led debates and practical actions concerning science, technology and development. On the one hand, the UK has a long and distinguished tradition in technical research, for instance in agriculture, health and engineering, with a significant proportion directed towards technologies for developing country application. Of particular note here is the extensive technical research supported over several decades by DFID under its Natural Resources Systems Programmes, as well as some work supported by UK Research Councils (eg Medical Research Council work on tropical disease control)—efforts supplemented by British contributions to international technology development (eg to the CGIAR system in agriculture). However, repeated evaluations have identified the need to link this technical research more strongly to social, political, institutional and policy questions.

5. On the other hand, DFID has been at the forefront of international debates about the institutional dimensions of development more generally. Institutional issues have been strongly highlighted in the White Papers on both poverty reduction and globalisation, while DFID country programmes have addressed, in many cases highly effectively, questions of governance, access, power, voice and participation in ensuring that development policy reflects poor people's needs and priorities. However, our research suggests these socio-political and institutional perspectives have more rarely been applied to issues of science and technology, with the relative silence on scientific issues in the two White Papers being echoed in most country programmes. A gulf thus remains, although one which DFID would be well-positioned to bridge if its broader experience around institutions, governance and participation were applied more concertedly, and in a more integrated fashion, to questions of science and technology.

6. Despite this gulf, there has been sufficient research and practical experience to date to suggest several key dimensions of this institutional agenda on science, technology and development. The evidence and arguments outlined below are drawn largely from applied research and collaborative activities between the Environment Group of the Institute of Development Studies, Sussex, and partners in academic, policy and activist organisations in developing countries.

## KEY THEMES

### *Framing science and designing technologies*

7. The institutional contexts and relationships through which scientific questions are defined, or problems identified, are crucial dimensions in whether poor people and countries genuinely benefit from them. Conventional approaches to the application of science and technology in developing country contexts have generally been based on broadly-assumed development problems—whether concerning ill-health, low agricultural productivity, poor infrastructure or environmental degradation—with scientific research deployed to refine understanding of their local or regional dimensions, and technologies transferred to help in their resolution. Recognition of the value of local or “indigenous technical knowledge” in adapting technologies to local ecological or social conditions has sometimes modified this model, with useful experience having accumulated especially around agriculture and natural resources. However there is evidence that in many cases the broader problems to which science and technology are responding are framed in ways which fail to match the realities, perspectives and concerns of people in developing countries. Solutions are thus channelled in ways which lead to missed opportunities, wasted investments, perverse outcomes such as further environmental damage or worsened agricultural productivity, and social and political tensions. Alternative framings suggest quite different approaches to solutions, or entry-points for technological change.

8. Many examples could be drawn on. In agricultural biotechnology, research agendas have to date been framed more according to the cropping and commercial priorities of developed country farmers, than by agendas arising from the food security needs of poor people in developing countries. In the water sector,

broadly-held assumptions about water scarcity at local and regional scales have justified scientific research and technological developments in water supply, but have overlooked realities around the dynamics of water distribution and established ways of living with uncertainty which would suggest quite different policy approaches. In forestry, broadly-held views of deforestation of “original” forest cover and the degradation of forest fallows in Africa have underpinned large-scale investment in forestry and agro-forestry technology. Yet alternative framings of forest dynamics in terms of climate history, non-equilibrium ecology and farmers’ land-use strategies both help explain which such investments have often failed, and suggest different technological entry-points building on existing landscape-enrichment processes. In agriculture and livestock development, widely-held evolutionary model of crop-livestock systems underlies and helps frame the promotion of mixed farming as a key target for external interventions to improve productivity and sustainability, through technologies to increase the efficiency of nutrient cycling, introduce improved stall-feeding regimes, and so on. However research in Ethiopia, Mali and Zimbabwe reveals multiple pathways of crop/livestock dynamics shaped by particularities of socio-economic and agro-ecological setting, historical dynamics, and institutional processes. The evolutionary pathway is only one among many possible others, and not necessarily the most desirable in some settings.

9. If science and technology are to respond effectively to the needs and priorities of poor people and countries, there needs to be greater attention to the institutional conditions under which such dominant, yet problematic, framings emerge and are sustained, and to ways of challenging them. Accumulating evidence from research and reflection on science and the policy process in developing country contexts shows the power of networks of “northern” researchers and institutions, funding agencies, business interests and international organisations in framing scientific and technological problems and agendas. The globalisation of science through the proliferation of international agreements and communications and knowledge networks is furthering a tendency for even localised problems in developing countries to be defined in internationally-standardised concepts and terms. Attempts at partnership with developing country researchers, or invitations to developing country citizens to participate and deliberate science and technology agendas, are frequently framed in these internationalised terms, and serve to extend them, silencing alternative perspectives.

10. This suggests a need to draw key perspectives emerging from broader development debates—concerning power and participation, “ownership” of agendas, and rights-based approaches—more firmly into debates around science and technology. It suggests the need to learn from valuable experience in the field of participatory technology development—in agriculture for example—but to extend this to include broader questioning of the framing of technological agendas. It suggests the need for donor support for independent, critical research within national and local institutions, and for the capacity for developing country institutions to respond to local agendas. It also suggests a need to build better-informed and more reflexive international scientific and policy processes is important, requiring new procedures that allow perspectives from developing countries to feed upwards into and shape terms of debate.

#### *Access and control*

11. Institutional arrangements at a variety of levels govern the extent to which developing countries, and poor people within them, can gain access to the benefits of science and technology and control over processes of innovation. As the contribution of the private sector to basic research increases in size and strategic significance with primary research increasingly funded or linked to private agendas, access to information about the impacts of particular technologies and ultimate control over innovation processes and their end products rests increasingly with corporate actors based predominantly in developed countries. As demonstrated by the GMO crop trials in the UK, access to information about known risks, uncertainties and areas of ignorance surrounding technological processes and their end products can be a significant factor shaping public acceptance (or rejection) of new technologies. Ensuring that relevant institutional processes (whether corporate, regulatory or judicial) are responsive to the needs and interests of the poor is a key challenge.

12. In the context of globalisation, these considerations are exacerbated because of the relatively weak capacity and external funding dependence of national scientific research institutions in many developing countries, as well as developing countries’ weak control over international flows of scientific and technological investment. In general the interests and views of poor communities, such as subsistence farmers, are marginalised in the few formal institutional processes that exist to further their interests. The introduction of agricultural biotechnology is again illustrative. Research into improving traits of interest to poor people (eg drought tolerance and resistance to salinity) in staple crops remains limited, with private proprietary science and technology focusing on other products where commercial returns are high. Declining levels of agricultural R&D supported by public funds in both developed and developing countries mean that public institutions cannot redress priorities skewed in favour of private gain because many basic “platform” biotechnologies are now covered by a complex “thicket of patents” owned by just a handful of life science corporations and thus no longer freely accessible for public goods research. While companies insist that patent protection is a pre-requisite for entry into new markets, restrictive and individualised patterns of intellectual property rights often have a negative impact on innovation processes, and these bear disproportionately on innovations that would benefit poorer communities or smaller producers. As the UK Commission on Intellectual Property Rights Final Report published in 2002 recognised there is a need to

balance the needs of formal innovation systems, now largely controlled by corporations, with the needs of those involved in public goods research (whether this is done informally by communities or through publicly funded institutions). Making institutions more responsive to the needs and circumstances of informal innovators, including small farmers, as well as questions and concerns raised by others not directly engaged in the process of discovery and innovation is an important future challenge.

*Regulation and accountability:*

13. A range of institutional issues also surrounds the regulation of technologies, their application and risks. Issues concerning the unequal distribution of gains and possible risks from technological interventions acquire particular pertinence in developing country contexts, where those who stand to lose may already be at the margins of survival. There are many examples of the severity of consequences for people's lives and livelihoods either where technological investments are directed to providing benefits for others—such as when rural people are displaced by flooding for large hydro-electric dams directed to urban power supply, or where poor communities are affected by industrial pollution. Issues of potential disbenefits from science and technology, and the ways these may impact on poverty, should be central to any agenda linking science, technology and development.

14. Questions of risk and regulation have become both more pertinent and more complex in the context of rapid technological advance and the emergence of new technologies such as in agricultural biotechnology or medical genetics. These new technologies throw up not just “risks”—involving calculable probabilities of known outcomes—but what is actually uncertainty or even ignorance about possible consequences. Whereas public policy and expert institutions have tended to cast the possible outfall of such new technologies in terms of a narrow, technical definition of risk, amenable to management and control, evidence suggests that publics often adopt much wider perspectives attentive to the broader uncertainties and social purposes implied by a given style of technological development. Citizen engagement with science and technology, whether through localised movements in developing countries or through networks of these forged between countries across the world, are frequently motivated by such broader perspectives, and by critique of public institutions for playing them down. Farmers' movements in response to the introduction of genetically-modified crops in India are a case in point. Important issues therefore arise concerning how the complexities inherent in science can be better understood by all parties, and communicated between them effectively, to facilitate effective regulation of new technologies. This requires attention not only to the relationships between the institutions developing and promoting technologies, and citizens' groups, but also to the media in developing countries and internationally, which plays increasingly important roles in the communication of risks and uncertainties.

15. DFID's own work on policies and institutions relating to sustainable livelihoods emphasises the importance of creating effective and responsive institutions if the needs and priorities of the poor are to be taken into account and acted upon. The challenge of managing technological choices is increasingly multi-level from local processes of decision-making and experimentation with technology choices, to creating an enabling environment for meaningful choice at the international level. For example, there is significant concern that the policy options developing countries have regarding forms of national biosafety regulation tailored to unique social and environmental needs are being restricted by trade disciplines emanating from bodies such as the WTO. An IDS review of attempts to involve publics in decision-making about the design of National Biosafety Frameworks found that goodwill is being undermined by perceptions that decisions are being made elsewhere and that priorities have already been set about forms of policy that are possible, discrediting attempts to engage publics meaningfully in a debate about science and technology choices.

16. Many studies on participation suggest tools and strategies that citizens can use to hold technology providers, be they governments or corporations to account. Innovative attempts to use citizens' juries, multi-criteria mapping, theatre as well as more formal hearings and commissions suggest an array of accountability tools that have been used in practice across the developed and developing world. A key challenge then is to construct institutional frameworks that enable poorer groups to be involved in technology shaping decisions and processes of priority-setting rather than only at the stage of designing regulations to manage the consequences of technological developments. Traditionally these concerns have applied mainly to governments, but given their central role in scientific research and technology development corporations are also experimenting in new ways of engaging stakeholders and communicating with publics. Often such initiatives are a reaction to concerns about access, such as recent attempts by pharmaceutical companies to make HIV/AIDS drugs available to groups that cannot afford them. Sometimes the initiative is more proactive such as recent moves by the biotech company Monsanto to set up smallholder initiatives with poorer farmers in India. As actors at the interface between technology and development corporations require incentives, regulations and sanctions where necessary to ensure that risks are not unduly passed on to the poor and that potential benefits reach those that need them most. This is part of a broader discussion about the respective merits of voluntary as opposed to legally binding forms of regulation for the private sector. Some combination of the two may be appropriate, but many insights about CSR (Corporate Social Responsibility) have been insufficiently applied to companies working in sectors where science, technology and development are closely intertwined such as biotechnology and pharmaceuticals.

*Future Challenges*

17. Greater attention to these socio-political and institutional dimensions within the debate around science, technology and development will be crucial if science and technology are to contribute effectively to poverty reduction and increased equity and justice, rather than undermining these. While there is, as we have noted here, already some evidence as to their importance, a major applied research effort based on a global network of social and natural/technical science researchers, in developing and developed countries, is warranted to refine and specify these institutional issues further, and to develop innovative policy and institutional interventions. The results could include directing scientific and technological advances more effectively to address poverty elimination and the Millennium Development Goals; sound expectations and management of scientific research and development expenditures, better focused policy interventions in food security, health and environment, a more effective approach to scientific capacity-building in developing countries, and identified means to build public trust in and legitimacy for institutions charged with developing, applying and regulating science and technology. Given DFID's track record both in scientific and technical research, and in institutional dimensions of development, participation and governance more broadly, albeit largely separate to date, DFID is well-positioned to spearhead the bridging of technical and social research within the broader international development community.

18. In this, important lessons could also be learned from research and policy efforts around science, society and governance in the UK and Europe. The 2000 House of Lords Select Committee on Science and Technology report on "Science and Society" argued for new models of dialogue and public engagement with science, and for greater attention to the framing of scientific agendas. Several current ESRC programmes, including the Science and Society and Sustainable Technologies programmes, are addressing issues around the governance of science, and the regulation of risks and uncertainties in largely British contexts. Both because of their inherent value, and because globalisation has rendered "developed" and "developing" country categorisations less tenable, there is an urgent need to link up these debates, and integrate the thinking emerging from these debates and programmes with concerns in the international development arena.

November 2003

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**APPENDIX 25**
**Memorandum from the University of Newcastle upon Tyne**

The University of Newcastle upon Tyne is very active in the field of developing countries research and has extensive experience of funding from the Department for International Development (DFID). Over the past five years the University has secured over 14 projects with funding of more than £8 million, from DFID alone.

1. *The coordination of different streams of government support for development-related research*

We believe that the Research Councils and DFID should develop a broader and more integrated approach when commissioning research in the context of international development. Currently, strategies and technologies must be strongly targeted at helping the poorest of the poor to be of interest to DFID, but EPSRC is not interested in work that is focused on developing countries, for example. Yet lack of money necessitates imaginative thinking: the restricted economic options of the developing world often lead to more innovative research solutions to problems than those developed in the affluent west—and these solutions can also benefit UK PLC. An example is research at Newcastle University on photooxidation in low-cost wastewater treatment plants in Brazil: this has been successfully "reverse-engineered" into disinfection technologies for UK industry—a double win. So a broader view of what constitutes an eligible project, both by the Research Councils and DFID, is recommended.

We can give a string of instances where successful development projects have been based on sound scientific and engineering research funded independently by the Research Councils. For example, research carried out at Newcastle University for the DFID Forestry Research Programme is aimed at ensuring the scientific understanding of the bio-physical and socio-economic relationships between forests and water are better connected with the policy making process. The project is working with policymakers and scientists in South Africa, India, Costa Rica, Tanzania and Kenya, and builds on fundamental research financed by the NERC's Centre for Ecology and Hydrology.

2. *The means by which DFID acquires and uses scientific advice*

DFID also needs to become more strongly engaged with existing expert academic and other professional groups in a way which informs their international development agenda-setting. Institutions are necessarily influenced by their own research base and we would suggest that DFID consider encouraging multi-disciplinary work between institutions.

### 3. *The influence of centrally-run research on country-led development programmes*

Coordination between DFID centrally-funded programs and country-funded programs has been a source of weakness in the past. The “Sustainable management of West Bank and Gaza Strip Aquifers project” led by Newcastle University, is an example of one which has benefited from a more coordinated approach. One suggestion would be an outline proposal stage: these proposals could be screened both in the UK and in-country prior to the commissioning of full proposals. What we particularly need to coordinate is the evidence of need in the countries, to where the funding is devolved, and the scientific expertise base which is more well known by DFID and other agencies in the UK. It is felt that the approach of the British Council, which devolves nearly all its resources to in-country programs, has experienced particular problems in this regard.

### 4. *The role of capacity building in overcoming trade restrictions*

It is not clear how building scientific, technological and engineering capacity in developing countries would influence their ability to overcome trade restrictions. In order for developing countries to become sustainable they will need to engage in this work in order to build infrastructure and capacity. However unless trade restrictions imposed by the developed world are relaxed, the consequence will always be a suppressed group of underdeveloped nations.

### 5. *Provision of training as a part of the UK's development policy*

UK education has a significant role to play in capacity building in developing countries. However, our fees are comparatively high, and this combined with increasing reluctance by government to fund masters and doctoral training of scientists and engineers from developing countries has led to a steady decline in the numbers of students coming to the UK Universities to develop their skills. This model of subsidy as a means to provide aid is one followed successfully in other European countries (eg the International Institute for Infrastructural Hydraulic and Environmental Engineering in Delft which has just been awarded the status of UNESCO training centre, yielding about 220 water managers per annum).

Importantly, the steady decline in this form of education has led to us falling below the critical threshold for the viability of courses to support this form of knowledge transfer, with the subsequent loss of whole programs of study. We appreciate that, once trained, there has been a historical problem with the retention of these graduates in their home country as the developed world offers much more lucrative job prospects. However the combination of tie-ins and incentives from their home governments has been shown to be successful in retaining these highly skilled individuals.

November 2003

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## APPENDIX 26

### **Memorandum from Dr Andrew Dorward, Director, Centre for Development and Poverty Reduction, Imperial College, London**

#### 1. *The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

Increasing liaison between DFID and the Research Councils is to be welcomed, however it is important that the arrangements become more transparent as regards their administration and as regards their specific focus, and that this is supported by a clear commitment by Research Councils to support of work in and relevant to developing countries. One of my colleagues, for example, reports that in their experience (with the MRC) applications for funds to undertake research targeted at developing countries may be given a lower priority (with very highly rated projects being turned down due to funding restrictions).

An important issue here concerns the prioritisation of research. One approach is that in addition to looking for rapid poverty reduction gains from research (and from better utilisation of existing knowledge), the UK government should pay particular attention to the science of longer term problems that are global, affecting both North and South, and require shared knowledge and cooperation. Such processes presently include, for example, climate change and shared processes of environmental change; pandemic diseases; biosecurity (and its effect on ecosystems and trade); bio-technology for small/poor farmers; information technology revolutions. Choice of research priorities should be linked to (a) the potential risks that an issue poses to achievement of the Millennium Development Goals, as well as its potential contribution to hastening their achievement, and (b) comparative advantage of the UK in that field. Better coordination across DFID, Research Councils and other research funders might aid in prioritization and also allow an

effective division of funding responsibilities to address different issues, and different aspects of these issues, in ways that reflect and accommodate particular funders' interests and mandates, but also properly "cover the waterfront".

A critical issue for DFID's new research strategy relates to its approach to prioritising research. This appears to have focussed on (a) developing a broad management/funding structure (discussed below, where we question the proposed balance between large programmes and smaller responsive research projects), (b) consideration of different funding mechanisms and partnerships, and (c) identification of topics for the "first round" of new research funding (in large programmes). Too little attention appears to have been given to mechanisms and processes for identifying research priorities of those who will use research outputs, with inputs from policy makers, business, civil society and DFID (and other donor) offices in developing countries. Given DFID's strong commitment to research relevance and uptake, this is very surprising. A major issue here is the need to overcome the very short term nature of much development work and development funding, and hence to look beyond the short time horizons forced on many working on development problems.

## *2. The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

This varies between different areas of DFID activity (for example research has been managed very differently in the health and natural resources sectors) and is in a rapid state of flux at present. Key considerations here are the balance between competitive bidding (and the processes of inviting and awarding bids) and ongoing relations with "core" providers. Increasing emphasis on competitive bidding is to be welcomed (provided that it is conducted in a way that is transparent and fair, and does not place too high a burden on bidders preparing bids—a problem in the past, but which DFID has to some extent attempted to address).

Increasing emphasis on the application of research to practical problems in developing countries is also important and welcome. However too strong an emphasis on this and too narrow a focus on today's problems carries the danger of undermining the basic scientific base from which to address tomorrow's problems—this base requiring both development of pure science (needed to underpin future applied advances) and scientists with both technical knowledge and knowledge of developing country problems/opportunities. We are concerned that the new research policy being developed by DFID will fall into this trap. DFID and the Research Councils need to consider together how to develop a proper balance in supporting applied research, pure research, and an appropriate level of expertise in the UK.

Current proposals for DFID's Central Research Strategy appear to be placing a very strong emphasis on funding relatively large programmes focussed around "major development problems". This is to be accompanied by a very substantial scaling down of smaller "responsive research" projects put forward from outside such programmes. This scaling down appears to be justified in terms of the high administrative cost to DFID of the smaller "responsive research" projects. The logic and benefits of this argument are highly questionable. First, costs have to be related to benefits, and evidence is therefore needed of the overall greater cost effective impacts of larger projects. Second, large programmes are inherently inflexible and slow, so that by the time a consensus has been reached around a "large problem", and the research tendering and commissioning process completed, a significant amount of time will have elapsed. To put almost all research funds into such a slow and cumbersome system is not a recipe for cutting edge research that addresses current problems and opportunities with current knowledge. Third, small and almost speculative projects can have major payoffs in setting up whole new lines of enquiry: to almost abandon this opportunity again seems very unwise. Fourth, very limited funding for "smaller responsive" project is likely to lead to increasing concentration of development related research in large specialist institutions. Where such concentration is needed in particular fields requiring large and specialist facilities, this will occur naturally in these fields. Further pressures for concentration are likely to be unhealthy—reducing the diversity needed for the intellectual and economic competition that stimulates good and relevant research. DFID should therefore be strongly encouraged to reconsider this proposed scaling down of funding for responsive research projects.

## *3. The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes*

Again this varies between sectors and countries but short term programmes and objectives tend to discourage country programmes from supporting longer term research—an issue that has become increasingly important over the last few years, and which needs to be addressed more thoroughly in DFID's central research strategy.



4. *The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced*

DFID is to be complemented for some recent initiatives in supporting these partnerships. However it is important that economic and institutional innovations for uptake of the outputs of such partnerships are given due weight—it is too easy to assume that once useful technologies have been developed then they will be taken up within developing countries, but all too often the economic and institutional conditions necessary for such uptake are not present. Consideration of these constraints, and of means of overcoming them, need to be built into these partnerships from the beginning.

We observe that despite increasing emphasis on private sector development, capacity building programmes still tend to be biased towards government agencies and NGOs, and their employees, and in many cases private firms are ineligible for support. While there may have been some small improvement on this in the last few years, there is still a long way to go.

5. *The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

Over the last 10 to 15 years there has been dramatic reduction in DFID support to scientific training. Support for MSc and PhD training has fallen dramatically and DFID explicitly excludes any support to formal PhD research training within many research programmes (see for example its recent call for research proposals). There are valid concerns about the cost-effectiveness of some postgraduate (particularly MSc) training: increasing cost-effective local provision in some countries and regions, and ability to finance it from local sources; tendency in some countries for scholarships to be awarded as part of patronage systems; limited long term use of such training; high attrition rates due to HIV/AIDS. However some of these concerns do not apply to some of the poorest countries (for example the ability to provide and finance good local training), while others are challenges that need to be addressed rather than avoided (patronage, limited use of training, and high attrition rates). Support for PhD training within funded research projects offers explicit opportunities for cost effective conduct of research at the same time as building research capacity in developing countries, while maintaining (again at low cost) the UK science/expertise base (as discussed under (2) above).

Another major problem is how to absorb trained PhDs and postgraduates into relevant positions in their countries. One immediate way forward is to link training to long-term development programmes funded by DFID providing support for relevant posts, including aiding and funding appropriate professional career development pathways. For more academic trainees based at universities and research centres, there might be a need to develop career establishment funding programmes to allow such individuals to return to home institutions with adequate start-up research funds to begin their research careers. Finally, coordinated aid to help develop scientific infrastructure—libraries, laboratories, computing facilities but also professional teacher training—could also lead to long term improvement in scientific capacity development.

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## APPENDIX 27

### **Memorandum from the Royal Institution of Chartered Surveyors**

The Royal Institution of Chartered Surveyors (RICS) is regulated by its Royal Charter with the objective of promoting the public good. This allows RICS to comment independently on matters that it perceives to be relevant to its profession. The RICS numbers over 100,000 members who work in both the public and private sector, including the areas of commercial and residential property, taxation, information technology, geomatics and geographic information and valuation advice on land, property and construction matters.

The main area of concern to RICS is in the provision and support of mapping and surveying technologies, of geographic capacity building and education and in the utilisation of UK based and/or local geographic knowledge to help guide development policy. To give a basic indication of the importance of good national mapping and its significance to the economic well being of a country. An OXERA report recently completed on behalf of Ordnance Survey GB stated that between £79 and £136 billion of Gross Value Added in the UK economy was dependent on geographic information.

There is a basic necessity for good mapping and geographic information in the developing world. Many countries have not been accurately or coherently mapped for decades and the current status of mapping in most developing countries is poor. From good land registration and administration to functioning land markets to utilities management to emergency relief aid programmes to marine and coastal issues to sustainable planning and development. Effective national management needs a sound, robust and coherent geographical framework. Recent RICS research has highlighted this need as has the work of the Global Spatial Data Infrastructure project (GSDI).

RICS Geomatics faculty research “getting it together—the geography jigsaw” looks at the current status of mapping frameworks and in its conclusion outlines some recommendations. A copy of the research and a recent conference paper is attached with this submission. RICS will be carrying out further research into this area in the new year.

In response to some of your bullet points.

*The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

RICS believes that DfID should try to develop a more coherent and holistic form of consultation regarding scientific input into development policy. The UK has many centres of excellence in geography and surveying, particularly in the areas of mapping and remote sensing (British National Space Centre BNSC). DfID should seek to integrate these professionals and their professional bodies such as RICS into the consultation process.

*The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes*

As outlined in the RICS research report “geography jigsaw”. Many developing countries have good professionally trained individuals working in their survey departments. Mapping and the provision of good national mapping empowers developing countries to seek their own solutions to many diverse issues. In the case of remote sensed imagery for example, the provision of cheap and/or nationally produced imagery can help countries to design and manage their own environments. Basing their decision-making on accurate, up to date and reliable information garnered from their own sources rather than from external agencies. The UK should try to capacity build in developing countries, both in education and continuous professional development for existing survey professionals, so that they are not wholly dependent on international aid in the area of geography.

*The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced.*

RICS believes that this is a critical area and one in which DfID should try to take the lead role. Many UK companies, government departments and academic establishments have world leading skills in mapping, surveying and geography. Two examples are Ordnance Survey, who until recently had an international department and until the 1980’s mapped the commonwealth to Ordnance Survey GB specifications through the Directorate of Overseas Surveys (DOS). Land Registry has also set up an international department. RICS, as an international professional membership organisation, has members worldwide, particularly in the area of geomatics (land and hydrographic survey). RICS believes that it is only through partnerships such as those encouraged by Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH that a real difference to development policy implementation can be made. Partnership criteria should be laid down and adhered to, best practice examples should be given and a consistency of approach applied.

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## APPENDIX 28

### Memorandum from Rothamsted Research

Rothamsted Research is an independent, BBSRC-sponsored Institute, which for well over a century has had a strong tradition for research addressing needs of developing agricultural systems. In recent years, scientists at Rothamsted have made important contributions to the sustainable management of pests on maize and vegetable crops in Africa and Latin America and on pesticide resistance management in cotton in Pakistan and provided expert support on disease diagnosis and statistics. Such research has been demanded, targeted at resource poor farmers and has involved the private sector and socio-economic inputs, where appropriate. The Institute has a major role to play in capacity building in certain disciplines and is already involved with NGOs to develop new training strategies, especially in Sub-Saharan Africa. Rothamsted Research has also emphasised efforts to “train-the-trainers”. The commitment to this has included the establishment of its own successful, donation-based, six to 12 month Fellowship Scheme through Rothamsted International, a charity based at the Institute. This has now achieved 100 Fellows, the vast majority of which have returned home to help build the research base.

In recent times there has been wide acceptance that in many developing countries agriculture is a significant engine for growth for the entire economy and that investment in this sector gives greater returns than in many other sectors. (See Ashley C and Maxwell S, *Development Policy Review*, 2001 19(4) 395–425).

This is inherently linked to the wider concern of food security and is not just a narrow “more production” issue. There are a number of demand-led initiatives around the world (eg NEPAD, Rockefeller BioCentres) that will be seeking scientific and technology partnerships from around the world (both developed and non-developed) and the UK should be well placed to supply this demand. However, it will require a response from DFID to help develop such opportunities to the full—but the DFID structure and policy is, ostensibly, not geared to react in this way.

Much of the research done in tropical countries by Rothamsted scientists has been financed and co-ordinated by the DFID Renewable Natural Resources Research Strategy (RNRRS), which terminates in 2005. The relevant programme management has done much to bring together UK and “in country” scientists to establish productive links to meet local demands. There is considerable concern that DFID, despite the consultations that have taken place, is not fully utilising the UK science base with much relevant experience and the development of the new strategy appears to be starting from a “clean sheet”. A rigorous evaluation of the successes and failures of the RNRRS in delivering demand led research for the alleviation of poverty should be completed before any new strategy is launched. This opportunity should not be missed. The current approach appears to disregard the wealth of opportunities that exist to build upon UK basic and strategic science base and move that into practice into developing countries.

The RNRRS programmes have made good use of a diminishing pool of UK scientists with experience in tropical agriculture and did much to increase capacity in a range of disciplines “in country”. The solutions to most scientific problems in agricultural development will require highly innovative research conducted by scientists with specialist knowledge. It is a dangerous assumption that most technology has been developed and simply needs to be transferred. Also, research that has demonstrated effects in replicated field trials must be scaled up to assess its effectiveness on a farm scale. Such increases of scale inevitably give rise to research problems that require well-trained scientists with local knowledge to develop sustainable solutions. It is essential that the role of science in agriculture and poverty alleviation is highlighted if DFID are to attract the best scientists; further erosion of some disciplines will mean that the numbers of scientists in the UK will be below a critical mass. This problem is not unique to the UK but has developed in most European countries.

The policy for DFID to provide direct budgetary support to developing countries so that they can access research providers worldwide has some merits in the identification of demand-led research. However, this is likely to work better in those developing countries with stronger economies, such as South and East Asia, than in many parts of Africa where capacity is limited. The scale of projects being considered by DFID to create impact in the alleviation of poverty may be too large for the partner countries to absorb. They will also require a significant change in the conduct of research projects within the UK scientific community, which is likely to have less than 12 months to re-organise.

Much of the research conducted within RNRRS programmes aimed to change farming practice and relatively little led to the development of products that might involve the private sector either internationally or within country. Also, there is a need to carefully evaluate whether the poor are able to afford such products. However, the involvement of local entrepreneurs (= micro enterprises) in the delivery of some technological advances such as biological control agents for the sustainable management of pests and diseases and the distribution of seeds of selected cultivars is essential and would require external support to establish.

Many other countries also use their Ministries of Agriculture (or equivalent) to take forward international development programmes for the benefit of poor countries. In the UK this responsibility rests exclusively with DFID whereas other Departments must have UK benefit as the primary and visible goal. DEFRA have recently largely removed any activity that could have a role in this context and DTI (of which OST is part) have a strict trade/investment perspective. In the first place, these strictures should be relaxed to enable greater flexibility. However, the current DFID approach to research commissioning has NOT been one that proactively stimulates, partners, co-ordinates and exploits the UK capability. Rather, it is increasingly a high level approach in which very large issue based projects are commissioned and these are left to respond. It must be clear that if DFID do not take this role seriously then not only will research of this type not increase in the UK, but in addition other research funders will tend to walk away from this area of research. This shift is evident in the approach of AFRC to BBSRC over the last 10 years.

Poor countries do not deserve poor science. DFID must adopt policies that not only seek out the best science globally, but also proactively encourage its development in the UK and exploit the enormous inherent willingness in the UK science community to participate in the capacity building in developing countries. The lack of understanding of the way in which the UK science base operates is apparent when in recent documents DFID emphasise DEFRA as their partners for research but exclude BBSRC Institutes. The current DFID policies will further exacerbate this overall problem and threatens to irreversibly erode UK science directed at developing countries.

#### IN SUMMARY:

- UK science is well placed to make major contributions to developing country capacity building, but this is declining dramatically and urgent measures are needed to reverse this;

- Research co-ordination in this area is poor as although only DFID have the remit to act for developing countries, it is not something that they actively wish to pursue;
- An apparent erosion of developing country agricultural /environmental research understanding within DFID means that they are less and less able to utilise what knowledge is available. This must be reversed;
- A review of the outcome/impact of the RNRSS programme should be carried out before the system is dismantled; and
- Training demand that could enhance UK influence and trade is not well addressed.

November 2003

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## APPENDIX 29

### Memorandum from the International Crops Research Institute for the Semi-Arid Tropics

#### ICRISAT AND INTERNATIONAL DEVELOPMENT

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is one of 16 centres of the consultative group for international agricultural research (CGIAR). The CGIAR centres were established to undertake cutting edge agricultural research and contribute to strengthening of agricultural research capabilities in developing countries in Asia, Sub-Saharan Africa and Latin America. The CGIAR works under an overarching goal of using agricultural science and technology to enhance food and livelihood security and to reduce poverty in line with the millennium development goals

ICRISAT has research centres in both Asia and Africa. It is the world centre of excellence for crop research in the semi-arid tropics with a central focus on crop improvement and natural resource management. Its main focus is on crops important to poor people—sorghum, millet, chickpea, groundnut and pigeonpea. The institute holds the world germplasm collections for these crops. Since the institute was established in 1972 its work has made a major contribution to agriculture and rural development in Asia and Africa. Highlights include: the release and widespread adoption of improved varieties of all focus crops; pioneering working on participatory plant breeding; nurturing the development and emergence of the private seed industry in India; the establishment of national crop improvement capability of sorghum and millet in Eastern and Southern Africa; pioneering work in natural resource management and socio economics and policy research. Recent efforts to develop an advanced genomic facility have positioned the institute to become a world centre for crop improvement for drought tolerance. The impact of ICRISAT's work on international development is significant and well documented. The institute's scientists have received numerous prestigious awards for ground-breaking work relating to the agricultural systems of the worlds poorest people.

#### ICRISAT AND THE UK

The ICRISAT like all CGIAR centres is funded by multilateral and bilateral donors including DFID. Funding from DFID is through both as a core unrestricted contribution, as well as through project based funding. The later has come from a number of DFID's Renewable Natural Resources Research Strategy (RNRSS) research programmes. These projects involve collaboration with scientific organisations in the UK. ICRISAT has benefited significantly from DFID support both in terms of research funding as well long term secondment of scientists from UK organisations (notably the Natural Resources Institute and the Overseas Development Institute). Historically UK nationals have formed a significant proportion of the scientists at the institute. Currently the Research Director is a UK national (originally a professor at the University of Reading). Three out of the institute's six programmes are led by UK nationals. Quite clearly the UK science base and financial support from DFID for research at ICRISAT has made a major contribution to achieving international development objectives. Collaboration with UK organisations has been particularly valuable as UK organisations have a reputation for pursuing innovative approaches in development research that simultaneously address both technological and socio-economic concerns. Similarly it often acts as a way of linking the efforts of UK scientist, international centres and national research programmes. Equally DFID has reputation for encouraging and supporting projects that are the cutting edge of scientific and developmental thinking.

#### *Agricultural research and international development: emerging trends and needs*

Over the past 30 years of ICRISAT's work in both Asia and Africa our understanding of ways of employing science in international development has evolved, as indeed have the needs of national research programmes and the poor themselves.

First and foremost it is evident that, more than ever science, technology and innovation are the main drivers for creating wealth and reducing poverty. International experience tells us that without innovation, social and economic development cannot take place, and that science and technology underpins this process.

It is acknowledged that equating more food production to less poor people grossly simplifies a complex reality. Equally it is also recognised that policy and institutional frameworks have been a major bottleneck in poverty reduction in many countries and that these deficits also need to be urgently tackled. Nevertheless without agricultural innovations the largely rural populations of developing countries will not be able to cope with the rapidly changing challenges and opportunities that this vital sector faces. These include: the emergence and spread of new pest and disease problems; environmental degradation; climatic change; interlocking agriculture and health issues such as food safety; and the rapidly changing demands of highly competitive global markets. These factors affect the poor whether they are farmers, consumers or employed in rural economies dependant on agriculture. Innovation is central to dealing with these issues.

Two major points follow from this. These concern, firstly, the nature of contemporary development research tasks in which science and technology needs to be deployed. And, secondly, the nature of the capacities that are required to deal with these tasks.

The nature of contemporary development research. Many of the contemporary development issues are complex in nature cutting across traditional disciplinary and sectoral boundaries. Often technology and institutional or policy development are interlinked and cannot be dealt with separately. For example:

- DFID has supported a series of projects address the food safety issues of aflatoxin contamination of groundnuts. This has included development of approaches to reduce contamination, but it has also included the development of low cost testing kits so that permissible levels can be monitored and enforced in marketing systems. This is particularly important in relation to international trade.
- In Malawi and Mozambique ICRISAT is exploring ways of developing linkages between poor farmers and international markets as a way of providing the incentives to adopt new and more efficient production technology. Again here the combinations of technical and market development have been crucial.
- DFID has supported important research on improving the animal feed and human food qualities of sorghum. This responds to the complexities of mixed crop / livestock systems that the poor depend on.
- Recent work in the area of biotechnology has started to address the need to help developing countries with bio-safety frameworks to underpin the deployment of the new biosciences. DFID funded research at ICRISAT to understand gene flows in pigeonpea has provided an important scientific basis for policy and institutional development in this area.
- DFID has funded policy research at ICRISAT exploring the nature of innovation processes and the institutional arrangements needed to shape these processes in pro-poor ways. This has been linked to research investigating partnership based approaches to post-harvest technology development, promotion and use.
- Work on characterising rural livelihoods is another example of research responding to the need to link technology development to wider developmental patterns and trends. This has received strong support from DFID.

These are just a few examples of the way technology development is being married up with the wider institutional and policy developments required to ensure that science and technology interventions are translated into innovation and socio-economic change. DFID has been central in supporting and encouraging a more holistic engagement with these sorts of complex research problems and this is an important contribution that is influencing the way international science and technology resources and expertise are deployed.

#### *Nature of capacity for innovation*

Capacity development has been a large element of the work of CGIAR centres such as ICRISAT. This has concerned capacity development in terms of developing the research skills of national agricultural research organisations. It has also concerned technical assistance where CGIAR centres have helped countries deal with generic problems by collaborating and providing additional expertise to develop technical solutions. Underpinning these approaches has been a number of assumptions: namely that the central source of innovation would be either the international centres or national agricultural research; technologies could be developed centrally and transferred with wide applicability; markets and public extension mechanisms could deliver technology to farmers; and that development research tasks were relatively simple and amenable to solution by disciplinary science (plant breeding or agronomy or pathology etc) in the public sector.

As the discussion of recent research at ICRISAT suggests it is increasing the case that development research tasks are in fact: highly complex and require multidisciplinary approaches; and involve a range of organisations from research and non-research organisations from the public and private sectors, including farmers and policy bodies. Furthermore often many of the links between science and technology or research users are missing or not functioning and need to be investigated and developed empirically; and technology is rarely generic with wide applicability, but instead is highly context specific requiring locally relevant ways of developing and diffusing it. Taken together what this means is that emphasis needs to expand from

focusing on developing technologies for transfer (and the scientific skills to develop these technologies). Instead emphasis needs also to be placed on developing the capacity of local systems made up of multiple actors who are involved in the innovation process. And that this is concerned both with strengthening interconnections and relationships as well as strengthening skills. It is increasingly been recognised that these so called innovation systems need to form the framework for capacity development.

This does not mean that research capacity is no longer important. Neither does it mean that public sector agricultural research is any less important or that the private sector or NGO can substitute its role. Indeed it is quite clear that for many years to come, and particularly in Africa, public sector science and technology will have to underpin agriculture innovation. It is equally apparent that this will require significant financial support and technical assistance from the international development community. However the implication of this emergent view of innovation capacity is that international assistance will need to concentrate on developing scientific skills as part of a much bigger entity that goes beyond the boundaries of conventional research systems. These efforts will also have to focus on building linkages and supportive institutional arrangements that can enable a more joined-up innovation process. Collaborative research projects, including those with the UK science base, are still very important as they form an operational, task orientated basis for exploring and strengthening local innovation systems.

At ICRISAT and we have started to respond to the implications of this new way of working, with partnership with the private sector and NGO becoming a core way of working at the Institute. Some examples include:

- ICRISAT has partnered with a consortium of private seed companies to develop sorghum and millet hybrid varieties.
- DFID funded research is allowing ICRISAT to explore how it can develop better linkages between the poultry industry, farmers and scientists so that a new market for sorghum can be developed.
- DFID's business linkage challenge fund has been used to investigate ways making groundnut markets work more effectively in Eastern Africa.
- ICRISAT's natural resource management scientists are partnering with a major rural development project funded by DFID in southern India. The significance of this is that not only is a valuable way of providing technical backstopping. But also that it builds a longer relationship with rural development agencies helping shape future research priorities and building technology diffusion pathways.
- ICRISAT's long term capacity development programme on sorghum and millet in southern Africa has adopted a partnership based approach to develop seed systems and crop commercialisation.

It is important to note that the work of ICRISAT, including that funded by DFID, is not only pursuing new ways of working with, for example, the private sector, but also it is influencing international development policy on these issues. To make the same point differently, not only is DFID funding of ICRISAT and the UK science base responding to new ideas about innovation capacity development. But also it is leveraging the experience gain by influencing best practice in the international development assistance community. DFID will only be able to continue to play this strategic role in international development policy if it continues to invest in the world class science and technology resources both in the UK science base and in the international centres of the CGIAR. As was mentioned earlier, poverty reduction will only take place when effective use of science and technology is deployed to underpin the innovation process.

*November 2003*

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## APPENDIX 30

### Memorandum from the Geological Society of London

The Geological Society of London, founded 1807, is the UK's national body for Earth sciences and the oldest geological society in the world. It has almost 9,000 Fellows worldwide, and is both a learned and professional body, recognised by DTI as the chartering authority for appropriately qualified Fellows. It is a Registered Charity, No 210161.

The Department for International Development (previously known as, variously, the Ministry of Overseas Development and the Overseas Development Administration) has sponsored programmes involving geoscientific research in developing countries since the organization's inception. In the early days, prior to the mid 1970s, such research tended to be country specific and was funded and administered through the geographic "desks" of the department.

Prominent among such research programmes were large scale data collection and interpretation programmes, such as geological mapping, which often covered substantial areas of the countries in question, lasted for several years and involved UK geoscientists, being based residentially in the developing country and attached, where one existed, to the country's national Geological Survey.

This policy evolved naturally following the earlier establishment, and staffing, of many of the Geological Surveys by the British Government through the Directorate of Overseas Geological Surveys which was later to pass from the control of the Commonwealth Office to be amalgamated with the Geological Survey and Museum of Great Britain to form the Institute of Geological Sciences (part of the Natural Environment Research Council), today known as the British Geological Survey.

As the organizational and administrative structure of the Overseas Development Administration evolved, so did its approach to research with some research projects being established under the various “professional” Divisions that were separately funded and not necessarily country specific as was the case with those sponsored by the geographic “desks”.

Geoscientific research that was not country-specific was sponsored by the Engineering Division of ODA mainly by an annual subvention to the Overseas Division of the then Institute of Geological Sciences. Under the annual subvention an agreed programme of research was carried out each year with research proposals for the somewhat ad hoc programme largely emanating from the IGS scientists.

By the early 1990s the Engineering Division sponsored R&D programme had become much more formally structured with projects involving geoscience being found in the sections covering Water Resources (including Marine Activities), Energy Efficiency, Urbanisation and Transport and the section named “Others”, which included a subsection entitled “Geoscience”. By the mid 1990s, “Geoscience” had become a Sub-sector of the renamed ODA Technology Development and Research Programme and an annual and open round of bidding was conducted for project funding under the programme.

Also by the mid 1990s the large country-specific geoscience programmes had almost disappeared and as a result the total annual direct investment by DFID in geoscience research for developing countries had as a consequence been greatly reduced.

## COMMENT

### *The Country-Specific Programmes*

The country specific projects or programmes formed an important element of the UK’s bilateral technical assistance to the particular country targeted. They were usually long term, lasting for at least three years and sometimes extending for longer periods thus allowing time for real capacity building within the counterpart developing country institutions. This was enhanced by the residential nature of the projects whereby many of the British scientists involved were able to develop good social relationships as well as working relationships with their counterparts and a deeper understanding of the problems facing the country’s research institutions.

Many of the geoscience projects involved assisting the national Geological Surveys to carry out very extensive geological mapping projects (the whole of the landmass of Sumatra for example) and involved the training of large numbers of counterpart scientists, both locally and through scholarships to educational establishments in the UK. A substantial amount of work was also carried out in groundwater exploration, groundwater being, in many cases, also the responsibility of the national Geological Survey.

The UK gained an enviable reputation for its work in these areas and fortunately this reputation, and the experience gained, enabled the British Survey to bid successfully for many similar projects funded by the World Bank and European Development funds when DFID withdrew from the field.

The reasons for DFID’s loss of interest in geoscience projects were several. The increasing emphasis in official policy on poverty alleviation, social problems, good governance and the environment, to many of which the provision of good local geological information was of great relevance, resulted in DFID policy being largely driven by social scientists, environmentalists and economists with little sympathy for scientific research, however applied and practical it might be.

DFID’s own staff acting as technical and scientific advisers (many of them engineers with experience in the developing world) appeared to be increasingly sidelined. To the “desks” that funded the country specific programmes, “geoscience” became equated solely with mining, an activity that was apparently seen as leading to adverse social and environmental impacts. Furthermore, the policy of rotating the staff responsible for development matters in the Embassies meant that the collective memory of a successful project within the country was relatively short and even very successful geoscience (and other) research projects had a shelf life in the Embassy of very few years.

### *DFID R&D projects in the Geoscience Sector*

The DFID (Engineering Division) R&D programme and its renamed successors the Technology Development and Research programme and Knowledge and Research programmes all had clearly laid-down strategies that had evolved to take account of increased environmental and social concerns. This was a responsible attitude that led to an increase in multidisciplinary. The programme was reviewed from time to time, usually by internationally recognized experts, and largely with positive outcomes.

A point of criticism, however, was that the research results were insufficiently disseminated among those who might most benefit from them. Although this problem was increasingly addressed (and the submission of a “dissemination” strategy became a requirement of all project proposals, which it was hoped would lead to much greater “take-up” of any new technology or techniques developed by the research) take-up remained unimpressive.

The R&D (TDR and KAR) Programmes were meant to develop technologies and methodologies that could increase the effectiveness of the British bilateral technical assistance programmes administered and funded through the geographic desks. The desks, therefore, would seem to be one of the most obvious clients for the DFID research products as most of the developing countries were unable to afford implementation programmes. However this only rarely seems to have happened, perhaps largely due to poor communication within DFID and the decreasing importance of advisers within Divisions such as the Engineering Division (subsequently the Urbanisation and Infrastructure Division) and their links to the “desks”. Good research outcomes were undoubtedly wasted by the administrative and financial fragmentation of DFID’s research programmes.

November 2003

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## APPENDIX 31

### Memorandum from Natural Resources International

#### INTRODUCTION

1. Natural Resources International Ltd (NR International) is an independent company, which specialises in managing consultancy projects and research programmes in the natural resources, environmental and rural development sectors, as well as in cross cutting areas such as institutional development. Clients include the World Bank, European Union, Asian Development Bank as well as the Department for International Development (DFID).

2. The company currently manages five of the ten research programmes within DFID’s centrally funded research strategy, known as the Renewable Natural Resources Research Strategy (RNRRS). These programmes are Crop Protection, Crop Post Harvest, Forestry, Livestock Production and Post-Harvest Fisheries and their total value has ranged between £10–13 million per annum since 1995.

3. The RNRRS for the decade 1995–2005 contributes to poverty elimination in low-income countries through the generation of new knowledge in natural and social sciences and promotes its use for the benefit of the many poor people whose livelihoods depend on natural resources and agriculture. The contracting-out of the management of disciplined-based research programmes to Universities and companies such as NRInternational was a deliberate effort by DFID to “strengthen the links between demand-led strategic and adaptive research and technology development and transfer; and to enhance the value for money of investment in natural resources research through improved efficiency and effectiveness.”

4. The RNRRS programme management teams have delivered their objectives since 1995 by identifying and implementing interventions which contribute to poverty elimination in DFID target countries. They have commissioned interdisciplinary research projects involving a mix of natural and social scientists from a diverse range of institutions. The managers and their advisers have also identified and utilised appropriate dissemination channels whilst building capacity in the science base of developing countries.

5. NR International asserts that these and similar interventions, will undoubtedly contribute to the achievement of the Millennium Development Goals.<sup>18</sup> The company therefore welcomes the opportunity to provide evidence to the House of Commons Select Committee on the use of science in UK international development policy.

#### EVIDENCE

*The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

6. NR International has worked largely with DFID on the use of science in UK development policy through the RNRRS. This submission will therefore refer mainly to the company’s role in the RNRRS and use of science in DFID’s development policy, although the Forestry and Livestock Programmes also contribute to cross governmental advisory panels and European Union initiatives relating to global environment, trade and poverty reduction issues.

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<sup>18</sup> The Millennium Declaration adopted in 2000 by all 189 member states of the United Nations, centrally addresses the challenge of poverty reduction and its eight Millennium Development Goals (MDGs) provide a framework for measuring development progress.



7. The research programmes managed by NR International have developed, maintained and expanded their successful networks of research providers in the UK and overseas to ensure the delivery of high-quality, validated natural and social science research outputs on topics which are of direct relevance to poor people. This is often in consultation with agencies such as NGOs and community based organisations (CBOs) who have broader mandates on poverty reduction. Many promotional projects in the programmes are led by overseas institutions with technical backstopping from UK based and/or International Agricultural Research centres. The latter include many of the centres funded by the Consultative Group on International Agricultural Research (CGIAR) which recognise and value the specialist inputs from the UK institutions which include those supported by UK research councils and DEFRA.

8. The programme management teams are advised on programme implementation through co-opted independent committees (Programme Advisory Committees (PAC). These advisory committees are comprised of technical, social, economic and environmental specialists drawn from some 57 UK institutions; a few are based in overseas institutions. Each programme has a lead adviser from DFID who guides the programme on DFID policy initiatives and ensures that selected projects meet demand and development criteria. Many of the PAC members have formal linkages with UK Research Councils and Government Departments and they keep programme managers abreast of UK Government science policy or relevant UK research networks and initiatives as well as initiatives in the global development arena. The PAC also provides expert advice and oversees a transparent and fair process on project selection; alerting the programme manager to opportunities to add value and to enhance the uptake of the outputs from the programme.

9. Whilst this has worked well, there have been limited opportunities for Programme Managers to link formally with other UK government departments and we welcome the creation of the UK Sustainable Development Task Force in May 2003, which aims to provide a forum for dialogue between key stakeholders and Ministers on how, in the light of the World Summit On Sustainable Development (WSSD) outcomes, the delivery of sustainable development can be best achieved.

10. *Recommendation:* We feel there are valuable lessons to be learnt from RNRRS programmes and recommend that the Task Force and Government for a, with similar functions, should draw upon experiences from the RNRRS in facilitating demand-led pro-poor research for the benefit of other government departments with an interest in sustainable development and eradication of global poverty.

*The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

11. As mentioned earlier the contracting-out of the discipline-based research programmes to companies such as NR International and Universities was a deliberate effort by the then Overseas Development Administration (now DFID) to strengthen the links between demand-led strategic and adaptive research and technology development and transfer. The programme management teams are composed of highly experienced natural and social scientists who have lived and worked in most of the low-income countries.

12. The programme management teams provide scientific advice to DFID and assist in implementing its policies by:

*Developing research strategies*

- Ensuring that DFID research is relevant and responsive to the needs of poor people;
- Ensuring that quality of research is high, combining the best of technical and social science expertise; and
- Facilitating partnerships between scientific researchers, implementing agencies and other donors/organisations involved in knowledge promotion to enhance impact of research on poor people.

*Managing programme finances*

- Ensuring accountability, impartiality and transparency in the use of public funds.

*Monitoring and evaluating projects*

- Improving effectiveness of DFID research and ensure that projects are conducted in line with DFID's mission to eliminate poverty.

*Promoting and communicating outputs to maximise outcomes for poor people*

- Improving poor people's access to knowledge and technologies;
- Raising public awareness of project outputs and DFID's mission through research; and
- Facilitating policy development.

13. The programme management teams at NR International, although highly experienced researchers in the development arena, do not commission themselves through their own research programmes, but are fully commissioned by DFID to guide researchers to use their skills and knowledge to deliver solutions which affect the livelihoods of poor people. In addition, the NR International managers have had the flexibility to innovate and to adapt quickly to policy shifts in developmental research. The ultimate goal of the RNRRS management function at NR International is to ensure that DFID funded research is not driven by curiosity or UK vested interests but is demand-led and relevant to the needs of the poor and can contribute to outcomes which will eliminate poverty.

14. The monitoring and evaluation function of the programme management teams is central to their purpose. Each programme produces a comprehensive annual report to DFID and undergoes an annual review to ensure that objectives and financial targets are being met. The report from the five programmes is now produced on CD-ROM and dispatched to DFID country advisers as well as project leaders and policy makers in over 20 countries. The programme management teams also contribute to DFID's requests for information which are used to prepare submissions and draft letters for the Secretary of State for International Development on agricultural, livestock, forestry and fishery research issues.

15. *Recommendation:* We strongly believe that contracting out of the research management function from DFID has resulted in strong efficiency and effectiveness gains. As such, we believe that an independent assessment of the value of this approach should be included in any future evaluation of the RNRRS.

*The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes*

16. This has varied over the course of the RNRRS, but NR International programme managers, conscious of the lack of dialogue and coordination between RNRRS research and the in-region activities of the national, bilateral and multilateral institutions, initiated a process to improve linkages. In the case of E.Africa, they developed common mechanisms to share and exchange information; the DFID East Africa Natural Resources Research and Development Coordination Office (RCO) was set up in September 2000 to link the bilateral, multilateral and centrally-funded programmes for added value purposes; to reduce duplication and conflicts between the programmes and promote synergy and collaboration between them. It also has a function to develop an awareness of non-NR sector activities being funded by DFID within the region which are supportive of a livelihoods approach to development. There was also consultation with representatives of the National Agricultural Research Systems in the region, and they too recognised a need for coordination amongst themselves, DFID and other donors.

17. The RCO has established a robust network of key actors in natural resources research and development within the three countries. This network places the RCO in a position not only to validate DFID research activities against the evolving national policies and strategies, but also to use lessons from DFID research to directly inform the national processes of policy and strategy development. In Uganda this has been the major activity of the RCO. With the approval of the DFID Rural Livelihoods Advisor in Uganda, the Regional Coordinator participated in the review of the National Agricultural System as a member of the Task Force set up for the purpose by the Minister of Agriculture, Animal industries and Fisheries. The output of the Task Force is a report with recommendations that are being used to reform the system.

18. In addition, the RCO has established very strong links with the Association for Strengthening Agricultural Research in Eastern and Southern Africa (ASARECA). The Regional Coordinator is now recognised as the *de facto* facilitator of the annual planning meetings of the ASARECA research networks. This activity—undertaken as a DFID input to ASARECA processes—anchors the DFID Programmes into the regional activities.

19. One of the RNRRS programmes has extended this model further and established three more regional co-ordinators in West and Southern Africa, and South Asia. Research regional offices have assumed greater responsibility in identifying the major researchable areas, and the most relevant institutions to work on these problems. By implementing an “innovation systems” approach to natural resources research, NR International is promoting more effective articulation of demand and therefore appropriate research, a much greater emphasis on partnerships, and the institutional relationships between the partners (who often include both producers and users of knowledge), and a flexible action-oriented research process. This new approach (named “Partnerships for Innovation”) is being independently reviewed to produce evidence/lessons for future research approaches/programmes.

20. At country level, the priority for agricultural development is to create a policy and institutional environment that provides opportunities for poor people to derive a better livelihood from agriculture. This is likely to include the reform of policies, institutions and laws to improve poor people's access to land, markets and services. In the 2002 agriculture issues paper “*Better livelihoods for poor people: the role of agriculture*” DFID emphasized that investment is also needed in global public goods such as international agricultural research, encouraging public-private partnerships and greater demand-responsiveness. In this context a cross-cutting promotional project (INNOVA) in Bolivia involving three of the RNRRS programmes, Bolivian research partners, representatives of the Bolivian agricultural system and DFID La Paz, is exploring methodologies which can better characterize the demands of poor farmers and link these

to the research process and supply of technology innovation. The result is the development of a new style of project that is funded through a variety of sources, and with a broad mandate that addresses farmers' needs on crop protection, marketing, soil and livestock management. The project provides an alternative model for supporting natural resources research that is of interest to the new DFID Central Research Team through its new project in Bolivia, "Facilitating Innovative Technology" and the new Bolivian Agricultural System.

21. The RNRRS programmes are in position to support this new type of promotional innovation project because major constraints had been correctly identified and applied research funded during the earlier stages of the strategy on component technologies which involved partnerships between UK and developing country research institutes.

22. *Recommendation:* We believe these new approaches to development research offer considerable advantages over the traditional linear research development models and we recommend that DFID should incorporate lessons learnt from the RNRRS when developing its new research strategy.

*The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes*

23. Significant contributions which have built capacity amongst developing countries to overcome trade restrictions include the following outcomes from NR International managed programmes:

- Kenya is considering making a change to its crop protection legislation that would help its horticulture exports and workers in the industry. This has been achieved through the work of the Crop Protection Programme. The programme has influenced government policy in collaboration with the Kenyan Agricultural Research Institute (KARI) and the Pest Control Products Board (PCPB). *The amendments to existing legislation will assist smallholder farmers in Kenya to comply with EU maximum residue levels and EUREPGAP requirements.*
- Legislative and market requirements in the food industry are developing rapidly and constantly. There are very few channels to pass this knowledge on to food producers in developing countries. Yet without it, these producers cannot meet the requirements of the European Food Industry and forego trading opportunities with Europe. The supply base for European food buyers is being increasingly centralised into a narrow set of well-developed food production companies, who seldom or never purchase inputs from small/poor farmers. The Crop Post Harvest Programme commissioned research to understand the market requirements and opportunities for re-processed tropical forest products and dried fruit and vegetables grown by poor farmers. The outcomes include an interactive CD Rom "*E-Guide: Breaking into Mainstream Food Markets in the UK*". This is a decision-making tool for producers, exporters and manufacturers. It advises on importation, certification, ingredients, production, quality control, design, packaging, new product development, marketing and retail and during 2003, it was demonstrated at seven roadshows in Ghana, Uganda, Zimbabwe and India.
- Huge increases in the number of urban poor (eg in Nairobi, the urban slums have tripled in size over the last 12 years and provide three quarters of the city's work force) have rekindled interest in and the importance of urban agriculture and livestock (UA/L), particularly for the more marginalised—widows, the sick, elderly and the huge numbers of unemployed. However, in most African cities UA/L is prohibited through byelaws left in place by the colonial powers. In an effort to modify these byelaws whilst addressing the problems associated with UA/L in major East African cities (access to common land and water, sanitation issues, communicable diseases including zoonoses, lack of advisory/credit services) the Livestock Production Programme convened a series of in-country and regional multi-stakeholder workshops involving policy makers and city planners, representatives of the UA/L communities from the cities concerned plus interested civil society organisations. As a consequence of the dialogue, awareness raising and common concerns for the plight of the poor, *changes in legislation are currently being formulated to create a more enabling environment for UA/L, so facilitating better services and introducing controls.* Such a multistakeholder dialogue approach has also been introduced to improve the plight of the 20 million strong pastoralist communities in India and there are some encouraging developments at the policy level.
- A Forestry Research Programme funded project is looking at the potential for commercialisation of non-timber forest products. The study is led by UNEP-World Conservation Monitoring Centre and brings together UK and local partners from the research, commercial and NGO sectors. Although trade in non-timber forest products (NTFPs) has been widely promoted as an approach to rural development, NTFP commercialisation is often not successful and no appropriate analytical approaches are available to assess the reasons. The team analysed the factors influencing success of NTFP commercialisation in Mexico and Bolivia. The stakeholders identified 45 factors which significantly limit commercialisation processes and overall success, the most important of which being product marketing and sale. Although the project is not concluded, it is already clear that *some of the project's findings are pertinent to other (forest) products, especially the clear need*

*for policy change, in particular land tenure and environmental policies.* However, strict policies executed by transitory government bureaucrats cannot be the solution as it could open up pathways for corruption. Since the research team has been working closely with policy makers since the beginning, there is now evidence that changes in attitude have occurred.

*The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced*

24. NR International is a private company which has provided an innovative, transparent and effective management system to the public system which has combined research of a public goods nature for the benefit of poor people with new uptake and promotional pathways. We have had some success in attracting additional support from the private sector in knowledge transfer and capacity building. For instance, in its role as convener of the OECD InterAgency Initiative in Livestock Research for Development, commercial companies (eg Pfizer, Wellcome Trust etc) have promoted the vision and operation of the initiative in various ways such as through a sponsored website.

25. The programmes have also successfully captured marketing advice (see example above) and levered the support (both financial and in kind) of small to medium enterprises in promoting technologies in Eastern and Southern Africa and South Asia particularly for new socially and environmentally acceptable pest management technologies. These enterprises are likely to play a major role in poverty elimination in sub-Saharan Africa over the next decade by stimulating local economic growth.

26. *Recommendation:* Mechanisms to encourage and support the development of small to medium enterprises should be seriously considered by DFID to facilitate uptake of pro-poor innovations.

*The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries*

27. Although the DFID RNRRS research programmes were specifically instructed not to fund training, technology transfer by extension or institutional development in the original game plan for the revised RNRRS (known as the “Yellow Brick” May 1994) many RNRRS programmes have enhanced the skills base of researchers and implementing agencies in DFID target countries to ensure that the commissioned research was sustainable and could feed into country policies. The programmes found it necessary to support such training since opportunities through other agencies such as the British Council or DFID country offices were not always available in our target countries. Our experience indicates that vocational, PhD and MSc training linked intimately with demand-led research initiatives are good investments in capacity building for developing countries. Although the outcomes for poor people are difficult to quantify in the short term, the trained personnel are likely to be investments that will have positive payoffs far into the future and across a broad spectrum of commodities, research efforts and policy initiatives in their own countries. One study on the rate of return of Agricultural research in development and poverty elimination concluded that “The history of research in Uganda illustrates very well the impossibility of turning agricultural research off and on. It takes only a short lapse in research support to result in massive losses in human and physical capital that will require painful and expensive new investments to overturn”.<sup>19</sup>

28. *Recommendation:* We propose that capacity-building should be a major feature of a new DFID research strategy.

November 2003

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## APPENDIX 32

### Memorandum from CAB International

#### INTRODUCTION: CAB INTERNATIONAL

Established in 1913, CAB International (CABI) was the world’s first internationally-owned scientific agency supporting the agricultural science and information needs of developing countries. CABI has continued to evolve its structure and functions to continue to provide demand-led services to its 41 Member Countries, including the UK, that complement, support, develop and add value to national capacities in the generation, access and use of knowledge for sustainable agriculture, environment management and human

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<sup>19</sup> Laker-Ojok, R. (1994 a and b) “*The Rate of Return to Agricultural Research in Uganda: The Case of Oilseeds and Maize*”, MSU International Development Working Paper No. 42, and “*The Potential Returns to Oilseeds Research in Uganda: The Case of Groundnuts and Sesame*” MSU Working Paper No 45: East Lansing, Michigan, USA.

development. CAB International is one of the few international scientific organizations with headquarters in the UK. CABI has direct and indirect relationships in research and knowledge management for development with DFID, DEFRA and DTI.

#### SUMMARY

This memorandum addresses the issues raised by the Committee from the perspective of CAB International, an intergovernmental scientific organization owned and driven by the UK and 40 other countries, most of which are developing countries. CABI is not a UK organization, but has a research base in the UK and maintains global genetic resource and information resources in the UK on behalf of our Member Countries, including the UK. This paper addresses the issues from a basis of extensive experience of engagement with the processes and practice of the main UK scientific and development agencies concerned.

Key principles that have emerged from our consideration of the issues raised are:

DFID's programmes have done much to reshape thinking about the value and role of science in development and in society. Moves towards a more open system of research commissioning have challenged the value and role of UK scientific institutions. UK institutions are widely acknowledged to have inspired considerable innovation and to have developed significant scientific and technical capacity in developing country institutions. However, the world is changing and developing countries now naturally demand that their own institutions are supported to meet their own needs. This does not diminish the value of the UK science base, but requires new mechanisms by which it can legitimately engage with developing country needs. CABI has long established legitimacy across its Member Countries and has always been structured to respond to national demands. We propose various ways to improve the systems by which science, development agendas and UK technical capabilities can be combined to better effect in support of development and meeting the Millennium Development Goals. The paper also highlights various areas in which science interacts with an holistic view of development and trade, yet which are not at present being addressed as effectively as they might, given the capabilities within the UK and its links with the international system.

#### RESPONSES TO THE SPECIFIC ISSUES RAISED BY THE COMMITTEE

*The coordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

1. Government policy in development is strongly and logically aligned around the Millennium Development Goals. Research policy has moved to reflect these and we welcome the more strategic approach that has resulted in policy papers on international development, agriculture and other relevant themes.

2. FCO policy and DFID objectives will not always fit well as political and diplomatic priorities change. Nonetheless, in regard to science there is a need for consistent long-term planning for what areas will be addressed in each country and a recognition of how science and technology can form an intrinsic part of building positive relationships between the UK and other countries through long-term partnerships with local institutions. In our experience projects frequently end just as they are gathering momentum and new relationships formed can become difficult to maintain. It would be encouraging if science and technology considerations were included more explicitly within country support and poverty reduction strategies as they are developed, so that their relevance can be incorporated into policy and planning processes from the outset.

3. Over recent years, it would seem that the UK Research Council's agendas have moved a long way away from direct engagement with development issues. The BBSRC's fundamental genome studies are far-removed from providing immediate solutions to the many pressing problems in developing countries. Although developing countries see value in these technologies, it is not clear how they can be turned into practical and deliverable solutions to global challenges within the time-frame demanded by the 2015 Millennium Development Goals. As we understand it, BBSRC also has no mechanism to fund international organizations to create external linkages for the work of the institutions it funds. The success criteria used by Research Councils can be excessively academic for these purposes and may have questionable relevance to real development outcomes and find little audience among other stakeholders in development. There is a fundamental difference in purpose also, in that the Research Councils are disciplinary in focus and organization, while DFID implicitly requires multi-disciplinary approaches for successful support to development.

4. DTI and DEFRA's willingness to engage with UK expertise and promote it overseas is clear, but this would seem to contrast with DFID's policy of de-linking development assistance from UK inputs. There are few other countries taking this approach to such a degree and other developed countries stipulate or actively favour involvement of their own research bases, for example:

- France recently announced an increase in their overseas development support, with the stated intention that one of the key delivery mechanisms would be via technical assistance.

- Australian agricultural research support (ACIAR) has to both involve Australian institutions and be of benefit to Australian producers.
- USAID implements its agricultural research programmes in general through US agencies such as the Land Grant universities or via international bodies that it funds at core.
- Germany's agricultural research for development operates through GTZ as a preferred implementing agency.
- Denmark is moving from core support to Danish institutions to contractual arrangements for delivery of development activities in science via Danish institutions.
- Sweden has a strong focus on scientific capacity development, linked back to implementation by, and training programmes with, Swedish universities.

5. In each case, these countries see a justification for their own expertise being used into development support activities that reflects both advantage to the recipient country and the maintenance of practical scientific connection with the developed country's own scientific advancement, both benefiting long term connection with the country in question. In the case of the UK, there seems to be more of a divide between DFID's desire to see development supported through science and commitment to make use of UK or UK-based capabilities, or retain these as a long-term resource of future value.

6. This de-linking has arisen from legitimate concerns that free market principles should be used to obtain the best possible basis for work and in part reflect developing country concerns at potentially supply-driven mechanisms. We would suggest that the absence of a true free market and a mechanism by which institutions can be driven by true demands will ultimately estrange UK scientific institutions from input to development thinking and practice. The net outcome is that UK institutional expertise in science for development is diminishing rapidly, in some cases being replaced by external developed country inputs or freelance consultants providing no institutional frame for future support to the UK's development agenda. Nonetheless, this also creates opportunity for new ways of working that are driven by clear beneficiary demand and within which UK expertise can be engaged as truly appropriate. This requires effective engagement with regional bodies through organizations that are able to objectively bridge needs and UK capabilities.

7. The DEFRA Darwin Initiative provides a strong and explicit linkage between UK science and biodiversity needs in development. Mechanisms by which this Initiative links alongside DFID's funding of biodiversity work, to create synergy between programmes supported under the two schemes, are not clear from the outside and there could also be a more visible linkage between the Darwin programme and demand-led processes from developing countries.

8. The role of the British Council in providing direct support of education opportunities for developing country scientists has been very significant in the past. However, one of the apparent outcomes of the "de-linking" of the British Council from implementation of training funds in the 90's was a rapid decline in support for training programmes in scientific areas, both as short courses and for postgraduate higher degrees. This has not been replaced by incorporation into research programme expenditure. This has adversely affected our training programmes in the UK and those linked with UK universities and weakened the associated long-term professional relationships.

9. The lack of commitment to European research in support of development within the EC and the transaction cost in work under the EC for institutions without core funding are major concerns for UK and UK-based institutions given the sums the UK invests in research via the EC.

*The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

10. The development of out-sourced research infrastructure and programmes under the DFID Renewable Natural Resources Research Strategy (RNRRS) has been a challenging evolution. By its end, more equitable systems have been developed in which research management has been separated from implementation. The RNRRS has been pioneering thinking in how research activities can be supported in response to explicit demands from developing countries and in how the process can be opened to direct commissioning of developing country involvement. By its nature this will tend to estrange UK institutions that lack specific recognized capabilities or a strong connection to developing country processes. The RNRRS policy of incorporating social science considerations directly into technical research programmes has been a very powerful driver for new thinking both within and outside DFID for the engagement of science with society and it has been noteworthy how many of these agendas have since come to take their place within UK domestic policy also; in this way the UK can learn from its development experience.

11. Nonetheless, the process has not been without its practical issues: A focus on small separately managed projects creates a high transaction cost for contracted researchers, potentially at the cost of scientific quality and value. In our opinion, the commissioning of a whole series of separate external organizations to manage each disciplinary sector impedes the coherence and flow of the overall programme. The lack of apparent linkage between DFID bilateral development programmes and the outsourced programme management has led to some rather arbitrary and independent engagement with country or regional priorities in development of research priorities. In practice, individual research contractors have

been largely expected to establish the links to development programmes themselves, despite the natural reluctance of development advisers to take on the transaction cost of taking up small-scale outcomes. Rather than being a programme that adds specific research value to wider development efforts within DFID, it has thus been a more generic association in which actual uptake linkages may be with agencies outside the UK system. This does not make the impacts any the lesser, but it seems unfortunate that the overall linkages cannot be established within a more unified system.

12. The competitive contracting process carries a high transaction cost in implementation, particularly for organizations such as CABI that are expected to charge the full economic cost of involvement and maintain an on-going institutional base without significant core support. In practice it has proved very difficult to recover the real costs of programme development, despite CABI being one of the very few organizations with a UK science base that has direct connection to both UK scientific institutions and developing country demands.

13. Direct commissioning of developing countries through this system is a worthy aim, but in practice there is little evidence to suggest that an apparent desire to see back-commissioning of UK expertise, where appropriate, will amount to any significant support to UK institutions. This can be argued as a clear expression of demand from developing countries for support to their own, rather than external agencies, but the contribution and potential contribution of the UK science base should not be unrecognized. The move from project funding of development programmes to budgetary support is laudable in many ways, in that it empowers developing countries to use resources as they think best. Most UK scientific organizations have neither the mandate nor the resources to devote to engaging with local demands from the outset, yet are not provided with a mechanism for doing so by DFID. In the absence of mechanisms by which developing country partners can be made aware of the value and costs of UK expertise and enabled to commission this capacity this is unlikely to provide effective involvement for the very innovative thinking and dynamic work for which the UK science base is known and recognized elsewhere. This could be addressed through an impartial commissioning agency to find matches with UK capabilities through strong connections with both overseas and UK organizations.

14. Experience would suggest that there are some inherent structural barriers to linkage between DFID research and DFID bilateral aid. Even where research outputs are perceived as of intrinsic value there is no requirement and in some cases no mechanism for uptake by the bilateral development programmes. In practice, such uptake is generally negotiated on a case-by-case basis.

15. Given its intergovernmental international status, within an enabling framework CABI could do much to link UK technical capabilities with demands made explicit by the regional fora etc in which we take part with our Member Countries, but there is no apparent mechanism within DFID for establishing such feedback loops. Increasingly, the demand for scientific research in agriculture is being expressed through regional, sub-regional and global fora, such as ASARECA (Association for Strengthening Agricultural Research in Eastern & Central Africa), FARA (Forum for Agricultural Research in Africa) and GFAR (Global Forum for Agricultural Research). CABI devotes considerable resources to engaging effectively with these locally-owned systems to ensure that programmes meet expressed local demands. Development of programmes in this way carries a high transaction cost, yet can provide a well-validated process of engagement with a wide range of relevant stakeholders. It is frustrating to see little active support for these processes within DFID; in essence the entire transaction cost ends up with the programme implementer.

16. The mechanisms for contracted research also create their own hurdles to effective uptake. By each project developing its own contractual basis with local partners there is a high transaction cost in the development of each case and an inconsistency in partnerships where institutions are partners in one context and competitors in another. This has been addressed to a considerable degree by the consolidation of projects into clusters focused on particular countries or sub regions, but there is generally little clear evidence of associated buy-in to collaborative linkage from the DFID development offices in those regions.

17. The short-term nature of much research funding presents problems in achieving impacts, as do disconnects between the support provided to more “upstream” work such as molecular biology and its outcome in field measures. There is little vertical integration in most laboratory research to rural household processes and theoretical uptake chains have hit impediments on numerous occasions. A fragmented competitive funding system contributes to these constraints. DFID now has the opportunity to provide strategic vision of its aims in certain areas and mobilize resources in a coordinated manner throughout the system.

18. The new research programme currently under development learns from some of these structural lessons; by going for larger consortial programmes across disciplines it seeks to address these issues of scale and coherence. However, the open soliciting process by which research themes are being arrived at seems likely to favour policy interventions rather than the active use of science in addressing specific development challenges. Development of such consortia can also end up as very supply led, rather than driven by specific demands.

*The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes*

19. The extent of investment in research and the promotion of innovation in DFID's country level programmes has tended to vary, seemingly dependent on the diverse and evolving priorities and perceptions of the advisers and programmes concerned, rather than any overall vision. In part this reflects the changing composition of advisers over the years, the short-term nature of their placements and the reduction of in-house scientific capability within DFID. Where innovative bilateral programmes have been developed that aim to link research actively to the development agenda, these would benefit from an associated long-term commitment within bilateral development programmes.<sup>20</sup> Various reasons are given by advisers for this lack of connection between research and development; the high transaction cost and scale issues in taking up specific research outputs, a disconnect between the aims of centrally-funded research and locally-developed country strategies and a shift away from technical and project-based work towards budgetary support and policy issues. The latter has significant implications; if country development programmes are themselves focused strongly on influencing institutional policy and are not seeking to link external (UK) technical innovation and research processes then there will be no outlet for work in this area even where strong local demand exists in the country itself. CABI's contracted advisory service to DFID has similarly experienced little direct demand from advisers for technical support even though demand exists within the national system and where national partners have highlighted specific issues.

20. In their current research planning process, DFID have taken on board that communication of research outputs is a major need and are proposing to increase the resources devoted to this area. This is strongly welcomed, as there is a considerable feeling that not enough is being made of existing knowledge or of disseminating the achievements of the existing research partnerships developed under the RNRRS.

*The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes*

21. Trade in agricultural commodities provides a very significant opportunity for economic growth to enable countries to escape from poverty, yet has been the focus of relatively few UK technical efforts. As WTO agreements have successively reduced import tariffs, non-tariff trade barriers such as sanitary/phytosanitary (SPS) considerations and the potential impacts of biotechnologies have come to assume great importance in trade. In many ways, science is now the main arbiter of international agricultural trade<sup>21</sup>. However, support to the development of national scientific capabilities to address these issues has received insufficient attention.

22. The Asian Development Bank estimates the cost of technical resources required to conform to SPS requirements of WTO as \$150 million per country. This is an untenable cost for very many countries, despite having signed up to WTO agreements. Alternative mechanisms for establishing technical systems are urgently required.

23. An example is that under SPS provisions, each country is expected to maintain a reference collection of pest organisms to ensure that their inspection services are familiar with the particular characteristics of quarantine pests. Sadly, few such collections exist and even fewer offer support services to those concerned with trade<sup>22</sup>. More attention to these fundamental technical barriers to trade would mean that many developing countries would be in a stronger position for resolving trade issues with developed countries, who have the advantage of greater scientific bases and access to requisite information. By maintaining a strong focus on immediate local poverty issues, the UK has probably not given sufficient attention to this wider trade-enabling environment.

24. Crop pest identification and management remain major barriers to development. DFID has supported a Global Plant Clinic at CABI Bioscience's UK Centre for many years, through a series of competitive Advisory Services contracts. This draws on the relationship with CABI's biological and skills resources to provide fundamental support, to developing countries in the diagnosis and management of plant pathogens. The contract also directly involves as a full partner the complementary viral diagnostic capabilities of Rothamsted Research in the UK (a BBSRC institution). Notable recent impacts of this

<sup>20</sup> For example, the PETRA (Poverty elimination through rice research assistance) programme in Bangladesh has achieved much in ensuring demand-led systems for research and developing positive partnerships between research, extension and NGOs active in the field. By having this explicit focus, research is established as an intrinsic part of the overall development process. However, DFID bilateral support is now shifting towards central budgetary assistance, which will bring its own challenges for Bangladesh's scientific institutions in obtaining the effective release of funds for research and development activities in this area and in linking with any external expertise.

<sup>21</sup> Comment from the UN Conference on Trade and Development (UNCTAD).

<sup>22</sup> Over 90% of the world's taxonomic expertise resides in the developed world while 95% of the world's remaining biodiversity exists in developing countries. CABI maintains a global microbial genetic resource collection and identification service for its Member Countries, of around 30,000 living cultures and 400,000 dried specimens, within which is the UK National Culture Collection. Despite House of Lords Committee recommendations that support for taxonomy should be increased, this does not receive sufficient UK funding for its maintenance or the associated taxonomic skills required. Without such core support, the long-term future of the collection remains in doubt and CABI's support to developing countries is reduced through the costs of maintaining the UK's resource.



service have been; the first identification of the banana black sigatoka disease in East Africa, the diagnosis of the coffee wilt disease that has spread from Democratic Republic of Congo to most producer countries in East Africa and in the last year, the occurrence of a new banana bacterial wilt in Uganda. Each of these epidemic invasive diseases have presented major threats to rural livelihoods in East Africa and have led to large-scale regional management programmes supported variously by the EC, Common Fund for Commodities, DFID/NRIL, Rockefeller Foundation and Gatsby Foundation. Nonetheless, it has also been clear over the years that the development desks in country have had few practical mechanisms to either support or recognize the value of these serious quarantine issues into their field programmes. For these reasons, the current contract has actively engaged with the advisory services of key countries to pioneer new models for engagement with farmers and operation of locally-driven services, alongside processes of institutional change supported by DFID. While these activities have been valued and actively supported through the central research group at DFID in the past, and despite its clear importance as a unique supporting resource for development, continuation of this scientific service is far from assured as DFID restructures its spending.

25. Scientific information resources in this area have received good support from DFID, but DFID would also recognize that their investment in communication of research knowledge could still be improved.

26. NGO involvement in trade areas has a particular advocacy line towards fair trade and has received support from DFID. However, the NGO advocacy sector in many contexts actively opposes the use of technological solutions because of perceived negative social or environmental implications. A lack of internal scientific capacity in some cases also means that NGOs can have problems in absorbing positive scientific outcomes from research to put into practice on the ground. There is a need to bridge these gaps and bring the NGO and private sectors together into meaningful dialogues around science-related trade issues.

27. There is an engagement required also with the private sector food industries, for many of which there is an inherent tension between the needs of producer and consumer stakeholders. Food companies have a vested interest in ensuring food safety and directly or indirectly in ensuring the sustainability of production. DFID has considerable strength in its relationships with NGOs, but the links with the corporate sector and co-funding of scientific activities towards sustainable production are much weaker, in large part because the mechanism used in UK overseas development policy is primarily government to government and there are a number of constraints to direct engagement with the private sector.

28. There is a need to engage more actively with small producers, to ensure that best practice regarding technical inputs is disseminated throughout the trade chain and thus to ensure maximum benefits in market access and poverty impacts. Substantial awareness of the value of this direct engagement has been gained under past DFID funded research under the Crop Post-Harvest Programme.

*The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced*

29. CABI's experience with the UK chocolate and coffee industries has been that they have found it difficult to engage effectively in research and technology transfer support partnerships with DFID as cash crops appear to have a low priority within DFID. Masterfoods (Mars) and Cadbury's have developed an effective programme with USAID for co-financing of research and development of sustainable cocoa systems in West Africa. This has enabled some leverage of DFID-CPP research funding to support specific technical aspects and capacity building, drawing on a range of UK expertise. This view may change as the DFID Agriculture paper recently highlighted the cash crop sector as a key generator of economic growth for the rural poor, but DFID's development support remains heavily oriented towards subsistence systems at present.

30. On a global basis there is now markedly more agricultural research funded by the private sector than by governments. In the crop sector this has been in large part due to the emphasis on private sector plant breeding (itself privatized in the UK within the last 20 or so years) and exploitation of breeders rights and in turn the use of biotechnologies in development of new varieties.

31. Within the UK, Government funding has provided a comprehensive and thorough assessment of the implications of these technologies. However, similar issues confront developing countries where Governments have very limited scientific capability to draw from to make informed decisions. The UK Government could do much to promote informed debate in developing countries as to the value of new technologies for other countries where the needs and demands are very different from those of the UK. The need for UK government funded assistance to support the independent and objective evaluation of these technologies has never been higher.

32. Despite an immediate focus on the needs of the poorest, the realities of national economic growth require external investment. The UK government has an opportunity to link the contrasting agendas and drivers of public and private sectors; for example a reconciliation of IPR issues on global public goods research with the needs of the private sector could have a major impact in this area.

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*The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

33. There is a clear and continuing need for training to enable people from developing countries to determine and direct their own country's development. Concerns are often raised at the ongoing need to train scientific staff, but the attrition of qualified staff from the national agricultural research institutions to better rewarded jobs, emigration, or most sadly through the ravages of HIV/AIDS, create a continuing strong demand for further training, as does the widening gap between capital-intensive "upstream" research and the resources and capabilities of developing country institutions.

34. DFID has logically moved away from high cost UK training courses, but the replacement of this with alternative mechanisms such as split programmes or co-supervision of externally registered studentships is obviously a high priority. This is of concern because the linkage with UK universities has provided much past synergy and long-term partnership linkage with overseas institutions. Furthermore, the capacity development need has not gone away; a recent EC study of the situation in sub-Saharan Africa showed that self-sustaining systems have not yet been achieved and that both science and technology systems and the working environments of scientists were deteriorating.<sup>23</sup> As the global agenda moves on and new issues and ideas arise the need for external training and incorporating innovative thinking continues, albeit in different forms than before.

35. With regard to biodiversity and invasive pests there is a clear need for developing capacities in risk assessment. The Convention on Biological Diversity is often not implemented in developing countries because of a lack of information and in many countries which do have policies and programmes in place they are unable to meet their own objectives because of a lack of available expertise. DFID should examine the possibility of funding programmes to develop in-country expertise in this area. Clear links to the Global Environment Facility need to be formed to facilitate "joined up" development in these areas.

36. The withdrawal of the DFID Associate Professional Officer scheme has meant in practice that there are few opportunities, other than in the NGO sector, for young British scientists to gain the overseas field experience required to work effectively within or in association with the DFID system. This could produce future problems for DFID in availability of, or access to, relevant expertise required in technical areas. Other countries such as the Netherlands continue their schemes, but provide opportunities for both Dutch citizens and trainees from developing countries.

37. Training curricula in the UK institutions has also lagged behind thinking within DFID and others on the effective implementation of science for development. Training still focuses on scientific or social science disciplines without a clear bridging between the two. The Committee could usefully support a drive towards a broader-based development curriculum.

November 2003

Annex

## CAB INTERNATIONAL AND UK DEVELOPMENT SUPPORT

### HISTORY AND CONTEXT

i. CAB International (CABI) is an inter-governmental technical agency concerned with the generation, access and use of knowledge for sustainable agriculture, environment management and human development. The organization was founded as a scientific support service in 1913, in direct response to the threat posed by insects to tropical agriculture in Africa. From the outset, the value of a shared international resource was recognized and the organization was supported by a combination of funding from the UK and from the countries of the then British Empire. Ownership of the organization was and remains through an Executive Council representing all Member Countries. As the need for the coherent distillation and dissemination of agricultural scientific information became apparent, the organization evolved into the Imperial Agricultural Bureaux as an intergovernmental organization, becoming in turn the Commonwealth Agricultural Bureaux (CAB). It was duly recognized that the need for such services went considerably beyond the countries of the Commonwealth and in 1986, membership was broadened and it became a UN Treaty-level international organization, as CAB International.

ii. The organization is now owned and governed by 41 Member Countries, including the UK. Although the Commonwealth connection remains strong, around one-third of the Member Countries of CABI are now from outside the Commonwealth, including China, the Philippines, Burundi and Chile. As the largest economy among the Member Countries, the UK contributes the highest Member Country subscription, but these combined subscriptions (unattributed core) total just 3% of the organization's turnover (£20 million).

iii. CABI has evolved into a highly cost-effective development agency, providing services to Member Country and developing country organizations that complement, support, develop and add value to

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<sup>23</sup> Gaillard, J (2002) *Entre science et subsistance: quel avenir pour les chercheurs africains?* OCL 9, 455–463.

national capacities in agricultural and human development, environmental conservation and sustainable agriculture. From their inception, CABI's services have been provided in response to national demands and this principle remains a key strength, carried through to a unique model for international organizations in which costs of our development mission are met by a combination of sales of products, support from development assistance agencies and national governments and contracted work. Key resource capabilities are in biological and agricultural information (via the Information for Development programme) and applied biological sciences, particularly with regard to sustainable agriculture and small organism biodiversity.

iv. CABI is a decentralized organization, operating through partnerships with agencies and organizations in its Member Countries and directly driven by the needs of each region. With headquarters in the UK, operations in each region are led through our Regional Centres in Africa (Kenya), SE Asia (Malaysia), Switzerland, Pakistan and Caribbean & Latin America (Trinidad). In addition, offices in India, China and USA provide direct linkages with organizations and programmes in these major countries. Project staff are also based in other countries as required. Our operations have a particular focus in meeting the needs of Member Countries, but operate through links with numerous and diverse partners. These include extension and rural development organizations, NGOs, CSOs, national research institutions, universities and the private sector as well as international organizations such as the CGIAR and FAO and a wide range of development assistance bodies.

v. The partnership focus of CABI enables us to mobilize our resources and specific skills-base to complement local strengths and support the development of sustainable capabilities, from the local community upwards. Our Member Country composition gives representation of both developed and developing country interests, which with our scientific and technical objectivity, enables the organization to provide a natural bridging role in development and trade-related issues.

#### CAB INTERNATIONAL AND UK DEVELOPMENT SUPPORT

vi. The UK remains a key Member Country; our headquarters, most of CABI's senior publishing staff and around 40% of its scientific staff are based in the UK. CABI receives support for its science and technology activities in development from the UK Government via a number of routes:

vii. DEFRA is the membership organization for CABI in the UK and supports the Membership Subscription (£205,000). CABI has implemented a series of projects in biodiversity under the Darwin Initiative and has been involved in numerous DEFRA research programmes in partnership with UK institutions.

viii. As an international organization, CABI is not considered eligible for funding by the BBSRC, but we do actively partner a number of BBSRC institutions.

ix. DFID Research Section (Central Research Team) provides direct support to the CABI Partnership Facility (£200,000 pa), as programmatic support towards fulfillment of the development support objectives of CABI.

x. Through a competitive contract, CABI, together with Rothamsted Research, provides plant pathology diagnostic and advisory Services to DFID and its priority countries.

xi. A CABI staff member is contracted as research adviser on perennial crop pests to the Crop Protection programme of DFID, implemented through NRIL. DFID is a consortium partner in development of the CABI Crop Protection Compendium.

xii. CABI has implemented and managed numerous projects through the Crop Protection Research Programme of DFID, all in partnership with overseas partners and in nearly all cases in full partnership with complementary UK institutions (principally Natural Resources Institute/University of Greenwich, HRI, Imperial College, Reading University and Rothamsted Research). In addition to CABI's substantial research inputs, this has particularly included provision of overseas facilities for UK scientific institutions, establishment of local connections with national systems for UK organizations and direct project management and implementation through CABI's Centres in developing countries. CABI has also undertaken research through the Forestry Research Programme, the Natural Resources Systems Programme, the Flexibility Fund and the Competitive Research Facility.

xiii. CABI has recently been involved in working with DFID's Communication and Information Management Resource Centre to support development of their knowledge management systems under the research restructuring process.

## APPENDIX 33

### Memorandum from the Intra-governmental Group on Geographic Information (IGGI) International Working Group

#### PREAMBLE

1. Geographical information (GI) is vital to the understanding of patterns of need in international development, to the efficient targeting of resources and the effective management of development activity on the ground. Geographic information is any information which relates to a location on the earth's surface. Geographic Information Systems (GIS) are amalgams of hardware and software which allow the user to capture, store, analyse and display that information.

2. The Intra-governmental Group on Geographic Information (IGGI) was established in 1993 (previously known as the Interdepartmental Group on Geographic Information) following the Chorley Report, to enable departments to liaise effectively and exchange best practice for the collection, management and use of geographic information. In 1998 the name was changed to reflect the true nature of the Group, and a change to a more efficient and effective structure.

3. The mission of IGGI is "To Increase the efficiency of central government while enabling it to meet its responsibilities for provision of geographic information to the general public."

4. The IGGI International Working Group was formed in 2001 and brings together IGGI Members who work internationally or have an interest in the use of geographic information outside the UK.

#### GENERAL EVIDENCE

5. Geographic Information (GI) and Geographic Information Systems (GIS) together form an enabling technology which underpins the economic, social and environmental development of any country. Knowledge of the geography and the manifestation of that knowledge in GI, which can be used many times over in various applications, can play a key part of achieving the Millennium Development Goals. Put simply, information on "what is where" is crucial in analysing and determining appropriate interventions and then monitoring outcomes from those interventions. Current developments in GI and GIS allow considerably more value to be added to the process of intervention than ever before. However, this technology is used infrequently in UK's international development policy.

6. Government departments in the UK and worldwide are increasingly using GI to help them develop more effective policies based on relevant data. Knowledge of the location of population and resources is critical to the development of good policies to aid the citizen. Government agencies and service organisations are also taking up the use of GI and GIS to deliver citizen services more efficiently. For example:

- Land is a hugely important economic resource, and security of land tenure is widely regarded as of prime importance for a developed and sustainable economy. Secure tenure is predicated on the existence of satisfactory land information and the recording of land rights. Without up to date and accurate records land tenure security cannot be assured and government cannot administer the land appropriately. Such information about the land is one form of geographic information which is recognised by many development agencies as being important to the development of a country. Experts from UK government departments and agencies and the private sector have worked in this field on many projects funded by other development agencies such as the EU and World Bank.
- Epidemiological and demographic data is now regularly used by Health Departments in the developed world to develop healthcare strategies tailored to the location and the people living there. This produces a more cost effective implementation of policy. Analysis using GIS of similar information in developing countries can potentially lead to a wider benefit to the poor from the UK money spent.
- Central to democratic government is the election of representatives. As with the example above, the prerequisite for this is information on who is where, so that electoral divisions can be created, and the election process managed. Prior to the South African elections of 1999, GI and GIS were used to an unprecedented degree to leapfrog South Africa "not just to a democracy but a modern democracy, making a fair election possible on all practical fronts" (*Daily Mail* and *Guardian*, 2 June 1999).

The Office of the Deputy Prime Minister is planning to use GI to help to deliver its Communities Plan. If GI is important to the delivery of a plan for sustainable settlements in this country it is equally or more important in developing countries. Use of GI and GIS by government departments to facilitate effective governance can and should be extended to the policy-making departments in countries at all stages of development.

7. GI is a part of the information infrastructure of a country. It requires to be treated as such and plans must be put in place for long term investment in it and maintenance, as is the case for other parts of the national infrastructure. Rarely in the developing world is there sufficient investment in geographic

information at a national level. Too often it is seen as a small short term requirement of one particular project. The result has been small islands of costly data which are not standardised, not maintained, and of no long term contribution to the country's infrastructure. This concern has been the subject of research recently by the Royal Institution of Chartered Surveyors. (Ref: Getting it together—the geography jigsaw.<http://www.rics.org/ricscms/bin/show?class=ResearchReports&template=/includes/showresearch.html&id=50&faculty=Geomatics&faculty=All%20Faculties>)

8. To achieve such an infrastructure, commonly agreed standards are required so that data collected by different agencies can be used together. For example, if statistics on households are collected in census districts, and health services are administered by local authority area, there is an inability to use the valuable census data in the administration of health services. Alignment of the two functions to a standard set of administrative units will allow more synergy and better service delivery. In the UK this is known as “joined up geography” and IGGI has played a large part in working towards this. The principle is equally valid in all countries, but development or adoption of relevant standards is rarely considered in development work which tends to be short term.

9. Notwithstanding the need for an information infrastructure at a national level, the collection of geographic information can, using recent advances in technology, be done at a local level. The concept of participatory mapping is not new, but in India this has been married with developments from Media Labs Asia and the Centre for Spatial Data Management and Solutions to produce simple hand held GPS receivers which can be used by the community to map out and collect socio-economic information.

#### RESPONSE TO THE SPECIFIC POINTS

10. Specific Point 2: Currently DFID acquires advice on GI and GIS on an irregular and ad hoc basis. The structure of DFID, as it is understood by IGGI, is such that no one division has responsibility for GI and that it can potentially be a part of the work of many divisions. There is currently an informal group within DFID known as the “Virtual Geographers Group” which draws its members from a variety of divisions and teams. Whilst this is a useful group, its existence highlights the lack of a focus point within the formal structure of the Department for geographic issues and the exploitation of GI and GIS.

11. Specific Point 2: The Director General and Chief Executive Officer of Ordnance Survey of Great Britain is the Adviser to government on matters relating to GI. Requests for advice from DFID are always welcome but are received extremely rarely averaging less than one request per year. It is understood that low use is made of similar advisers in NERC.

12. Specific Point 5: The UK public and private sectors are acknowledged internationally to be expert in the field of GI and GIS, and in particular in its use in governance. Innovative use of GI has significantly enhanced the ability of government, both national and local, to determine policies based on firm information, and deliver citizen services efficiently and effectively. There is considerable knowledge and experience available in both sectors which could be tapped by DFID to assist in the implementation of the UK development policy abroad.

#### RECOMMENDATIONS

13. We recommend:

- that DFID raises its awareness of the potential role of GI and GIS can play in achieving their targets;
- that DFID raises its awareness of the need for integrated geographic information infrastructures and extend its strategy to include assistance to developing countries to create and use such infrastructures;
- that DFID is reorganised to create a function which takes a lead on geographic issues;
- that DFID work with other parts of UK government and private sectors to utilise the skills and experience in the field of GI for the benefit of developing countries.

## APPENDIX 34

### **Memorandum from the Chairs of the Independent Programme Advisory Committees of the DFID Renewable Natural Resources Research Programmes**

#### SUMMARY

Nine of DFID's research programmes on natural resources management (agriculture, forestry and fisheries) constitute DFID's renewable natural resources research strategy (RNRRS) and are the UK's main avenue for supporting pro-poor research in the agriculture sector.

In the introduction to this submission, the importance of agriculture for addressing the Millennium Development Goals of reducing extreme poverty by half by 2015 is highlighted. Almost 75% of the world's poorest people are directly or indirectly dependent on agriculture, and productivity will have to double over the next few decades to keep up with population growth. This requires high quality research integrated with development that clearly targets the poor. Despite this challenge, DFID, many other OECD aid agencies, and developing countries, have been decreasing their support for agricultural research and development, as highlighted in a recent parliamentary review of DFID by the International Development Committee.

The UK science base has played a prominent role in pro-poor research and development over many decades, and is very highly regarded internationally. However, there are few formal linkages at the working level that coordinate this effort within an overarching UK strategy. The RNRRS programmes will be terminated in early 2005, and DFID, following extensive internal restructuring, has established a Central Research Team (CRT) within its Policy Division. The CRT is currently developing a new research strategy, and this submission raises a number of issues, which are felt to be crucially important if DFID is to capitalise on the major investment that it has made in natural resource research and development over the past decades. Brief recommendations are then made on ways to address a number of the issues, but clearly these need to be expanded upon through full discussions with Central Research Team and DFID's top management.

Of special importance is the need for DFID to assume a leadership role in developing a strategy that integrates research and mainstream development, and that formal mechanisms are established for achieving this, both centrally and in the country and regional programmes. In developing its new strategy, DFID needs to engage fully with the RNRRS programme managers, overseas partners and advisers, to capitalise on the vast amount of knowledge, experience and skills obtained over several decades. There also needs to be full involvement of the country offices, which can ensure that national stakeholders, especially representatives of the poor, can help set priorities. This will help address the perception that the new research strategy is being supply-driven rather than being led by the needs of the poor.

DFID also needs to continue to undertake independent impact assessments of the RNRRS programmes and of its other investments in research through bilateral programmes and the CGIAR. Lastly, there needs to be a major assessment of DFID's budget support for all research and development activities, that emphasises effective integration of both. This applies to private-public partnerships as well as to capacity building and institutional strengthening. Competitive funding systems should continue to be used, but due attention needs to be given to the absence of level playing fields in assessing the impacts of untied aid on UK research institutions.

#### INTRODUCTION

1. We are making this submission in our capacity as Chairpersons of the independent advisory committees of nine of the DFID programmes on Renewable Natural Resources Research Strategy (RNRRS). The programmes are Animal Health, Livestock Production, Crop Protection, Crop Postharvest, Fish Management, Post Harvest Fisheries, Aquaculture/Fish Genetics, Forestry Research and Plant Sciences. The members of these advisory committees include representatives from government and non-government organisations, universities and the private sector. The RNRRS programmes were launched almost a decade ago, and represent the principal means by which DFID supports research on the sustainable management of renewable natural resources (including agriculture, fisheries, livestock, forestry, and natural resource systems). The programmes are built on a solid foundation built up over many decades by the predecessors of DFID, including the Ministry for Overseas Development (ODM) and the Overseas Development Administration (ODA).

2. Approximately £200 million has been invested by DFID over the past decade in the RNRRS programmes, which are managed by a range of organisations based in the UK and partner countries, selected through a competitive tendering process. The programmes themselves subcontract projects to organisations in the UK and in partner countries, as well as to international centres.

3. Before addressing the six specific issues on which your Committee is inviting comment, we consider that it is vitally important to restate that the principal aim of the UK's international development effort is to contribute towards achievement of the Millennium Development Goals (MDGs). These address the challenge of poverty and aim to halve the number of people in extreme poverty by 2015. An interim MDG

has been set at halving the number of hungry people by the same year, from the current total of over 800 million. These goals will help put into context the role of science and technology in international development.

4. Our submission is concerned with science for development, with special emphasis on research on the management of renewable natural resources, but recognising fully that agriculture and the health sectors are strongly interdependent in a development context, as well as with other areas, including engineering and the environment.

5. A recent consultation paper by DFID on the role of agriculture in alleviating poverty (available on [www.dfid.gov.uk/pubs/files/agri\\_livelihoods.pdf](http://www.dfid.gov.uk/pubs/files/agri_livelihoods.pdf)) highlights the fact that almost three-quarters of the world's poorest people live in rural areas. Currently, the livelihoods of about three billion people are directly or indirectly dependent on the sustained productivity of agriculture, forestry and fisheries, and this figure will increase substantially with the foreshadowed increase in the world's population. As noted earlier, agriculture is closely linked with health through, for example, nutrition issues or diseases transmitted by livestock to people, and with engineering, where water resources management is a prime example. It is thus clear that agriculture will continue to be the mainstay underpinning food security and poverty reduction strategies throughout the developing world, and in particular in Africa. This has been stated over many years by almost all development organisations including government and non-government development organisations, the multilateral development banks and other international organisations. For a number of years, the policies of many donor agencies and developing countries have placed greater emphasis on areas other than agriculture. However, there are now compelling reasons for this to be re-assessed, as was highlighted in the recently published findings of the Parliamentary Select Committee for International Development (International Development Committee 8th Report [HC 825] Department for International Development: Departmental Report 2003).

6. The RNRRS programmes will terminate in March 2005, and it is not planned to renew them. The inquiry that will be undertaken by your Committee is therefore most timely in that it coincides with the development of a new research strategy that is currently underway within DFID. It is proposed that this strategy be completed by the end of this year, but it is to be hoped that it will remain sufficiently flexible to incorporate recommendations that emerge from the inquiry conducted by your Committee. Further comments on this will be made in last section of this submission.

7. Turning to the specific points on which your Committee is seeking evidence, we have the following comments to make, from the perspective of renewable natural resource research and development:

1. *The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID.*

8. With the exception of DFID, the agencies listed above (to which Defra should be added) do not appear to have departments or units formally devoted to fostering research that is specifically intended to benefit the poor in developing countries, although a number are involved with broader issues of global concern. In general, international activities of the Research Councils, Office of Science and Technology (OST), Department of Trade and Industry (DTI) and Department for Environment, Food and Rural Affairs (Defra) target advanced institutions in developed nations, especially in the European Union, with the objective of providing benefits to the UK itself. However, as noted below, the RNRRS programmes have commissioned institutes supported by several research councils, especially the Biotechnology and Biological Sciences Research Council (BBSRC), to conduct research on developing country problems.

9. Defra has overall responsibility for the UK's sustainable development agenda, and this includes an international dimension on biodiversity and related environmental issues. Global climate change is also included in the agenda. DFID participates formally in some of these initiatives at ministerial level formally through several interdepartmental committees, but this does not appear to provide a means whereby the different UK agencies involved in undertaking or funding science for pro-poor development can keep each other informed or coordinate their respective activities. A formal mechanism for such coordination is still required.

10. Despite the lack of formal engagement of the Research Councils and major government departments, other than DFID, there is ample evidence to show that in the area of renewable natural resources, the UK science base has contributed much to international development over the past decades. It has achieved this through activities in strategic and applied science, undertaken in partnership with developing country and international organisations. Its contributions have long been recognised and valued by those engaged in development throughout the world as being of the highest quality scientifically, and very relevant to the priority needs of the poor in developing countries.

11. Because of the lack of formal linkages between UK institutions involved in research for development, the collaboration that has taken place has frequently been opportunistic and not strategically planned. However, the RNRRS programmes have, through the leverage of their competitive funding arrangements and more strategic oversight of development issues, been able to foster greater engagement of institutions in the UK science base, as well as collaboration between them. As noted earlier, these institutes have

included several supported by Research Councils. Informal interactions have been fostered through the members of the independent advisory committees of the RNRRS programmes, as they are drawn from institutions supported by several Research Councils, and from a number of other government and non-government agencies, as well as the private sector. The RNRRS programmes have also encouraged greater interaction between social scientists and their technical counterparts, which is essential for all development programmes if the outcomes are to reach the intended beneficiaries.

12. In terms of drawing on the broader UK science base, there is clearly a major role and opportunity for DFID to: (1) provide leadership in developing a strategic framework that integrates research and mainstream development in a meaningful way and addresses the major priorities of the MDGs, and (2) providing incentives through competitive funding for institutions in the UK and elsewhere to become engaged in programmes developed through this strategy.

*Recommendation 1:* That DFID assume a leadership role in developing a strategic framework that integrates research and mainstream development to address the MDGs, and provides competitive funding for institutions in the UK and elsewhere to become engaged in programmes developed through this strategy.

13. This leads to the issue of DFID having untied its aid, and the impact of this on the involvement of the UK science base in pro-poor international development. In terms of research on renewable natural resources, there are two, no doubt unintended, negative effects. Firstly, while the principle of fair and open competition between institutions in the UK and elsewhere for DFID funding seems appropriate, it presupposes that there is a “level playing field” for all involved. At present, this is not the case. In the major European Union countries, most government research organisations receive significant core funding for staff and infrastructure plus part of their recurrent operational costs from their governments, IRD (Institut de Recherche pour le Développement), and CIRAD (Centre de Coopération Internationale en Recherche Agricole pour le Développement in France are two examples.

14. The international centres in the Consultative Group on International Agricultural Research (CGIAR) continue to receive a significant proportion of their unrestricted core funding from donor government sources. In contrast, UK organisations fully engaged in international development such as the Natural Resources Institute (NRI) (under ODA before privatisation) and many university departments receive virtually no core funding from government and must recover all costs from projects.

15. RNRRS research is often long-term, yet funding is usually limited to two to three years, and projects rarely exceed £250,000 annually. As noted earlier, this is insufficient to support new scientists or to acquire vital capital items. This situation has already had severe impacts on UK institutions and their ability to compete in the open market and is an incentive for those that receive Research Council funds to remain engaged in strategic research for the benefit of the UK, rather than seeking support for work addressing problems of the developing world. This situation is exacerbated by the poor ratings given to applied science for international development by the Higher Education Council for England (HEFCE) in its Research Assessment Exercise.

16. The second effect of open competition is that individual research organisations within the UK science base are increasingly competing against one another for available funding, rather than seeking to collaborate on problems of common interest and priority for the developing world. This is understandable in the prevailing financial circumstances. However, the critical mass of specialists in some key areas is already low, so special efforts are needed to foster coordination and collaboration, and to provide incentives to recruit a new cadre of young scientists to the area of research for international development. As noted earlier, the RNRRS programmes operate an open competitive grants system, but nevertheless encourage the submission of proposals that involve strong collaboration between UK institutions as well as with their developing country partners or advanced institutions elsewhere. The RNRRS programmes have also helped the UK science base to recognise that the identification of research priorities and development of strategies to address these must be driven by the developing countries themselves, with appropriate representation of the poor. However, this process now needs to be taken further in response to change, in particular the multidisciplinary and crosscutting nature of the problems underlying poverty in the developing world.

17. Having untied its aid programme, DFID has increasingly highlighted the scope for drawing on the international research centres within the CGIAR as research providers for its programmes. There are advantages in utilising these international centres, including the benefits of co-funding from a large donor pool, and the achievement of spillovers of research outcomes to a large number of countries, because of the centres’ global remit. However, it also has to be recognised that there have been significant reductions in the numbers of internationally-recruited scientists in almost all centres, so that the critical mass of specialists required to conduct research in virtually all areas, other than germplasm utilisation and conservation, is rather low. DFID does not provide funds for overheads or staff at CGIAR centres. The donors are also exerting heavy pressure for CGIAR centre research to become more applied and “near market”. For this reason, the centres are highly dependent on the formal research alliances that they have established with advanced research institutes in developed nations to maintain their credibility in fundamental and strategic science. A significant number of these advanced research institutes are in the UK science base. By using the science capacity and experience within the UK, and the RNRRS experience in managing programmes (eg in building interdisciplinary and developing country partnerships), DFID could get better value from its multilateral funding.



*Recommendation 2:* That in meeting its own multilateral funding goals, DFID consider achieving greater cost-effectiveness through co-ordinating mechanisms that bring together research and management experience within the UK to address the requirements of multilateral agencies for UK research capacity.

2. *The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes.*

18. Prior to 1995, most research addressing developing country problems was undertaken by the Overseas Development Administration (ODA, now DFID) itself, although significant work was also carried out in association with other UK government institutions and universities. Core funding was available from the ODA to support its in-house research institutions, which provided opportunities for long-term research. As ODA had its own in-house research capacity, opportunities were available to link research with centrally managed mainstream development programmes as well as with country and regional programmes—although there is no clear record of the extent to which this occurred or how it helped determine policy.

19. The creation of the RNRRS programmes has provided DFID with the opportunities to support demand-led innovative research that is directly linked to poverty reduction, and is conducted by technical and social scientists of world standing. The programmes also enable DFID to invest in partnerships with developing countries that enhance the opportunities for delivery and uptake of the technologies.

20. There is evidence to show that DFID uses the RNRRS programmes as its principal source of advice on science and research in the renewable natural resources area, and that this may sometimes be used to develop the Department's programmes and policies. However, there is no formal mechanism to ensure that, where appropriate, there are "joined up" strategies between research and mainstream development within DFID. This would among other outcomes, ensure that there is dissemination and piloted uptake of technologies derived from research. At present, "joined up" approaches are constrained by the organisational structure and operations of DFID, and this is arguably one of the most important issues to be considered in current development of a new research strategy at DFID. It is also of special relevance to country and regional programmes discussed in Point 3. This issue is also raised in the Surr Report (Surr et al, "Research for poverty reduction", DFID Research Policy paper, 26 September 2002), the findings of which have been accepted in large part as the basis for the new centralised research structure within DFID.

*Recommendation 3:* That DFID develops mechanisms for ensuring that there are formal linkages between research and mainstream development activities within the Department centrally and with its country and regional programmes.

21. What is perhaps less well known, but important to clarify, is that when the RNRRS programmes were established in 1994, they were explicitly excluded from engaging in technology transfer. This was done on the understanding that the partner countries themselves together with a range of donor agencies would fund technology transfer, including DFID through its country programmes. As noted under Point 4 below, DFID's country programmes rarely support uptake and scaling-up activities of the outputs from its own centrally-funded research efforts. While there are cases of other donors welcoming the opportunity to promote and upscale RNRRS outputs, including examples from the livestock sector, others asked to fill the gap might query this.

*Recommendation 4:* That DFID consider: (1) establishing a cost-sharing funding scheme available from both central and country offices, that could be competitive, for pilot technology transfer/uptake of research outcomes from its own activities; (2) creating opportunities for research programmes themselves to commission pilot technology / uptake work, also on a competitive basis.

22. While there have been many examples of well-targeted successful projects in the RNRRS programmes, there has been relatively little independent evaluation by DFID across all 10 programmes. It should be said that this is also true of non-research mainstream development activities of DFID. Limited evaluations undertaken so far have revealed very high rates of return for a number of projects, but there has been little effort to review lessons learned, and projects that were less successful or unsuccessful have not been analysed. It is understood that DFID is now supporting a round of more comprehensive evaluations of the RNRRS programmes, but it seems to be rather late to be taking stock of what has, or has not, been achieved in the past decade, given that development of the new research strategy is well underway. Whatever is done, there is a need to ensure that the methodologies and rigour of the impact assessments of the research programmes are similarly adopted for evaluations of DFID's investment in the CGIAR and bilateral programmes. A reality frequently ignored by donors is that it takes considerable time, often at least a decade, for the impacts of research on the livelihoods of the poor to be realised. This means that the full social and economic impacts of pro-poor research conducted by the RNRRS programmes over the last 10 years may in many cases not be apparent until 2015 or later.

*Recommendation 5:* That DFID continue to support comprehensive independent impact assessments for the RNRRS projects, extending these to similar evaluations of its investments in CG centre projects and bilateral programmes, and bearing in mind that significant impact on the poor may only become apparent after 10 or more years.

23. It has earlier been pointed out that there is a need, which also represents an important opportunity, for DFID to take a lead role in mainstreaming scientific research in the Department's development agenda. In terms of renewable natural resources, there was scope for the Chief Natural Resources Adviser to take a leadership role, but this position has been abolished, and there has been much discussion within DFID on how this might be achieved. The pros and cons of a DFID Chief Scientist post, similar to that in OST and Defra have been considered, and it seems that these functions have now been taken on by the Chief Environmental Adviser. However, the remit for the latter position is very broad, and does not appear to emphasise a high profile in science and technology. This suggests that the part-time appointment of a Chief Scientist, possibly with private sector experience, is still worthy of serious consideration as an option in the longer term. This high profile individual could, together with the Chief Environmental Adviser, be called upon, on a "needs" basis, to participate in international and high level UK fora, provide strategic advice for ministers and senior management in forward planning/horizon scanning, and play a leading advisory role in the integration and mainstreaming of research in DFID's development programmes.

*Recommendation 6:* That serious consideration is given to the appointment of a part time Chief Scientist to complement the role of the Chief Environmental Adviser.

24. The recent re-organisation of DFID's Policy Division into a large number of policy teams (including that for central research) has not included any formalised linkages between these groups and the RNRRS programmes. The same applies to the regional policy divisions. A number of the policy teams undertake work that also involves natural resource management, but have very limited funds, operate in short time frames, and have no brief to link with the RNRRS programmes. The lack of communication increases the likelihood of "re-invention of the wheel" in terms of work already completed by the RNRRS programmes. There is a clear need to address this apparent "disconnect" if DFID is to make most effective use of its own sources of information.

*Recommendation 7:* That effective formal linkages are established between the RNRRS programmes (and the entity to replace them) and the policy teams within the new Policy Division and the regional policy divisions.

### 3. *The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes.*

25. RNRRS programme managers keep the Country programmes informed of research activities proposed or underway in the particular countries or regions concerned, but there are no institutional mechanisms within DFID for formalising this process. There is generally little knowledge of natural resources research in the country offices, except in those countries where DFID has posted a natural resources adviser. RNRRS managers have reported variable experiences in linking programme outcomes with country programmes, much depending on the particular interests of those in charge of the country office. In the event that the latter are supportive, there are no formal mechanisms for securing funding centrally or from the country programmes. This is also commented upon in paragraph 21 above. There are some excellent exceptions such as the Livestock Production Programme's research project on smallholder goat production in Kenya, which stimulated DFID to invest several million pounds sterling for uptake of the technologies throughout the region. A much larger investment was made in the major rice programme in Bangladesh: Poverty Elimination through Rice Research Assistance (PETRRA), which included components from a number of RNRRS programmes. In both these cases, the main driver for moving the research into mainstream development was the personal interest and motivation of the DFID in-country advisers.

26. In most cases, the RNRRS programmes have actively leveraged funds from other sources to ensure that the technologies from research are disseminated and taken up widely. Examples include the Crop Protection Programme where additional funding has been obtained from the Common Fund for Commodities, International Fund for Agricultural Development (IFAD), United States Agency for International Development (USAID) and the national programmes to support national and regional uptake of technologies to address the emerging problem of whiteflies—arguably the most serious new threat to horticulture in the developing world.

27. In addition to formalising the process whereby information from the RNRRS programmes is made available to country programmes, preferably pro-actively, funding needs to be made available to ensure that this does occur. This should be provided on a competitive basis.

*Recommendation 8:* That DFID consider new mechanisms for integrating centrally-funded research with country-office funded activities, to implement priorities determined in consultation with local partners, in order to maximise the development-effectiveness of research.

28. DFID considers that there is much merit in providing direct budgetary support to developing nations, so that they can access research providers from anywhere in the world, according to their own priorities. In principle, this has merits, as the initiatives supported will be demand-led and thus are likely to have impact, and most funding will go to the developing country partners. This is feasible for stronger economies such as those in East and South Asia, but many countries, particularly in Sub-Saharan Africa, may not have the "political will", or sufficient capacity, to use funds effectively. Even if they have strong capacity, they may

not choose to use such funds for what is perceived to be expensive research support from the “North” unless these are earmarked for this purpose. Additionally, natural resource research is often perceived to be a long-term activity, slow to yield results, and as such is politically unattractive. For this reason, poverty reduction strategy programmes (PRSPs) may fail to give adequate emphasis to research or omit it altogether.

4. *The progress of UK efforts to build scientific, technological and engineering capacity in developing countries, and the co-ordination of these efforts with NGOs, charities and international programmes.*

29. Point 4 overlaps broadly with Point 6 below, in that it addresses issues of capacity building in the developing world through partnerships—a number of the comments provided therefore apply to both.

30. The RNRRS programmes have given very high priority to capacity building in partner countries. As the projects are based on partnerships, developing country scientists are involved from identification of priorities through to the delivery of technologies derived from the research. Additionally, the projects often include local NGOs and extension agencies for the “downstream” aspects of delivering outcomes to farmers and other intended beneficiaries. For example, the Plant Sciences Research Programme has developed novel participatory plant breeding and plant variety selection systems that are managed by the farmers, and have led to very significant and sustainable increases in yields and incomes of poor rice and wheat farmers in South Asia. Similar work is in progress in a number of African countries on other staple crops. The Natural Resource System Programme has developed community-led tools for poor communities in the Bolivian Andes to enable them to enhance production while conserving the resource base through their own management systems.

31. Despite its crucial importance in development, there appears to be no formal mechanism within DFID whereby capacity building in science and technology is adequately addressed or supported. The RNRRS programmes do not have the funds to do this at a meaningful level. Among examples of RNRRS work where such support is needed, is the knowledge “tool box” developed to address the problems of poor livestock producers in India. This was the result of research undertaken through partnerships between Indian and UK institutions and other stakeholders. Funding is now required at the state and national levels to “train trainers” in NGOs and extension agencies to ensure that the “tool boxes” reach the intended beneficiaries.

32. In the past, DFID had a number of competitive research small grant schemes designed to support capacity building initiatives. Such small grants were also useful for identifying research needs and for monitoring and assessing impact. Under current DFID policy, small grants are no longer available, although programme funds can be used for start-up or scoping activities. As a longer-term objective, capacity building requires and this needs to be supported by an integrated research-development over a number of years.

33. As noted in paragraph 22 above, the RNRRS programmes have been active in seeking funds from alternative sources to address this problem, including other government donor agencies, foundations, NGOs and charitable trusts. Additionally they have sought to link their projects with capacity building initiatives already underway that are supported by a number of these other funding agencies. However, such alliances are, of necessity, often opportunistic rather than strategically planned.

*Recommendation 9:* That funding is provided by DFID on a competitive basis for capacity building and institutional strengthening to those engaged in research and its implementation in partner countries. The funding should most appropriately come from an integrated research-development budget.

5. *The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced.*

34. The RNRRS programmes appear to have had relatively limited involvement with the UK private sector. In general, it appears that the private sector has little commercial interest in pro-poor research and development in the developing world, as the products are usually “public goods” and there is little likelihood of obtaining profitable returns on their investments, with the possible exceptions being those made in the large nations with strong economies, such as India and China and Brazil.

35. A number of the large multinational corporations, including those engaged in agribusiness, have established foundations as well as “humanitarian boards” which have agreed to transfer products and technologies, including those protected under IPR, without charge to research groups working for the benefit of the poor in developed countries. Most of these products have been derived through biotechnology and include technologies appropriate for genetic transformation of crops. RNRRS examples in the UK include Syngenta and banana transformation for East Africa. Other private-public sector partnerships have been established in South Asia and East Africa for the promotion of non-pesticide systems of managing insect pests and weeds.

36. An area of high priority in which the private sector is involved is that of seed technology. Poor seed quality is one of the major causes of low crop production in the developing world. Because of the need to make profits, private seed research tends understandably to focus on high value crops, rather than on food staples essential for food security of the poor. Appropriate funding schemes are needed that offer incentives for the private sector to provide technologies to local enterprise groups such as farmer associations.

37. DFID has recently conducted a number of exploratory exercises to identify appropriate mechanisms to stimulate investment by the private sector in pro-poor research, development and technology transfer, including establishing a Rural Enterprise Technology Facility (RETF). This work has led to greater understanding of the challenges involved in getting greater involvement of the private sector in pro-poor development, but not to any practical outcomes that provide opportunities for national or fledgling local enterprises. There are many reasons for this, but most often the lack of profit in pro-poor research, and weak public sector partners in the developing nations, especially in Sub-Saharan Africa. Experience in developed nations shows that private sector funding is only readily leveraged if there is a strong public sector partner also able to make a significant financial commitment. This is rarely the case in developing countries, except in the stronger economies in Asia and Latin America.

38. To date, the sole outcome of the RETF exercise has been to use the funds available for a major initiative to develop a vaccine for the principal tick-borne disease affecting cattle in East Africa. While this looks extremely promising—vaccines tend to provide the highest return to poor producers of any animal health intervention—there are many other opportunities that can be explored at different scales. These could involve support to local entrepreneurs rather than large overseas companies. Examples could be the production of a range of agricultural inputs, such as draught animal equipment, while strengthening entrepreneurs' ability to assess and respond to local demand.

*Recommendation 10:* That DFID provide funding for private-public partnerships that emphasises local enterprises, in addition to that already provided to leverage inputs from large overseas companies. The support should include capacity building and be made available on a competitive basis.

6. *The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

39. As noted in paragraph 25, some issues of relevance to Point 6 have already been made under Point 4.

40. RNRRS programmes place much emphasis on strengthening the capacity of partner countries, through training of researchers and extension staff to ensure sustainability when projects end. While reasonable numbers of scientists have received training to PhD and MSc level, many more could have done so if approval had been given for the use of RNRRS funds for this purpose. DFID's policy has been for such funding to be sought from other sources such as the British Council, but a number of RNRRS programmes have had little success with the latter because there are currently few scholarships available for tertiary degrees in the area of international development. Other schemes, such as "International Networking for Young Scientists" are linked to research councils, but address the priorities of the councils rather than of the developing world. Because of the difficulties of accessing funds to support student training from the British Council and other sources, some RNRRS programmes have reported that DFID has in such cases supported the use of programme funds for these purposes.

41. Training has provided benefits that can also be captured by DFID. For example, much of current DFID funded research and development work in Nepal is managed by individuals who earlier benefited from training funded through DFID (or its predecessor ODA) projects. Other similarly trained Nepalis have been recruited by international research and development programmes that are now partially funded by DFID. Additionally, several RNRRS programmes have pointed out that the trainees have progressed to include at least one president of a developing nation, as well as ministers and other high profile public figures. This provides opportunities for generating "good will" towards the UK that should not be underestimated. As an aside, the Foreign and Commonwealth Office (FCO) supports scholarships for military and security training for young candidates from "poor countries", and has made it clear that its hope is that those selected will rise to prominence and be favourably disposed towards the UK—food for thought for DFID.

42. Training itself is not enough if there is not also an appropriate enabling environment in the countries from which trainees are drawn. For example, the brain drain of trained professionals from African countries is of major concern, and one RNRRS programme has highlighted the opportunities for innovative funding schemes to encourage trained professionals to remain in their own countries as research leaders, and to play an active role in capacity building.

43. There are many training courses available, but it is crucially important that these are demand led, and that there is appropriate matching of students and course content, level and supervision. A significant number of excellent courses with very high demand, including some in livestock health, have been closed down because DFID has no longer provided sufficient funding to support the participation of developing country students.

44. The issues highlighted in this section indicate that there is great potential for DFID to contribute to international development by creating innovative new funding strategies for capacity strengthening that address current shortcomings. As evidence on training has been sought by your Committee, our comments above have focused on this. However, the implications for development are much broader, in that training is itself a component of capacity building and institutional strengthening. DFID needs to make a long-term commitment to provide comprehensive and effective support for this developmental necessity.

## 7. Conclusions

45. In this section, we attempt to draw together a number of key points from the body of the submission, to highlight some major concerns, and to make a number of suggestions on how DFID might address these in the future.

46. We believe that there is ample evidence to suggest that the RNRRS programmes have delivered outputs of significant value in terms of the UK Government's efforts to help meet the Millennium Development Goals. The programmes are demand-led and highly focussed on the poor. They are built on a foundation of well over 40 years of experience gained by UK development scientists and their developing country partners on poverty alleviation through the management of natural resources. Preliminary cost-benefit analyses and assessments of social impact of projects in a number of RNRRS programmes have shown that returns on DFID investment have been high, even when less successful, or sometimes unsuccessful projects are taken into account.

47. Having said this, there has been little independent evaluation of RNRRS programmes to gauge their performance and impact, and determine what lessons can be learned for the future, despite DFID's investment of £200 million over the past decade. As mentioned in a footnote to the Surr Report, in the field of livestock research, the percentage of funds that one CGIAR centre invests in impact analysis is fifty times higher than the percentage invested by DFID. We urge DFID to capitalise on the collective knowledge acquired through the RNRRS programmes in developing its new research strategy, and to continue to support comprehensive independent assessments of the impact of these activities. In doing this, it is important to recognise that the large scale developmental impacts of research (and indeed many other interventions) on the livelihoods of the poor may take 10 years or more to be realised—a point made earlier in paragraph 22. In this regard, it is important to ensure that research activities that are showing significant promise are integrated into mainstream development to increase the likelihood of pro-poor impact and thus help achieve meaningful returns on DFID's investments.

48. We fully recognise that there is a need for natural resource research to be responsive to changes in the external environment. This includes the requirement properly to integrate such research within the multidisciplinary crosscutting context of international development. Such matrix approaches will be needed to address the major development themes currently being formulated by DFID, and it appears that DFID favours the use of mega-projects to undertake such work.

49. Mega-projects can be effective if they are tailored to meet priority needs, but because of their scale, they are frequently supply-driven. Adequate attention therefore needs to be given to consultations with intended beneficiaries and their representatives during the project identification and development phases. Equally important, the absorptive capacity of partner country personnel and institutions needs to be taken into account when embarking upon such projects. While transaction costs of mega-projects are lower than those of small/medium sized projects, their scale may create difficulties for developing country partners and result in the returns on the investment being lower than those from more modest activities. Additionally, many developing countries still manage their natural resource research and development on a commodity/sectoral basis, and their organisational structure also reflects this. These issues can be addressed if projects, whether they are large or small, are developed through a consultative demand-led process.

50. In this regard, we note that DFID's Central Research Team has been developing its new research strategy through a series of consultative meetings and calls for submissions addressing a number of proposed themes. The process has so far been supply-driven in that it has only involved research providers and DFID management. It is recognised, for reasons given in paragraph 28, that appropriately representative involvement of partner countries in central strategic planning may be difficult to achieve. However, as suggested in recommendation 8 (paragraph 27), the country offices could play an important role in this process. The RNRRS programmes are required to be demand led, and have consistently followed this policy. Their collective experience should thus be drawn upon in the development of DFID's new research strategy.

*Recommendation 11:* That DFID ensure that there is full engagement of developing country partners, including representatives of the poor, in the development of the new DFID research strategy, drawing on the country offices to assist in this process, together with the RNRRS programme managers and advisers.

51. It is also understood that following the end of the RNRRS programmes in 2005, there may be a period of two years before the replacement research strategy is in place. It is thus critically important that, over the next two years, there be full engagement between the Central Research Team and RNRRS management to maintain continuity. This will help ensure that the very extensive research and management skill base and networks that have been established over a long period of engagement with developing country partners are retained and fully utilised.

*Recommendation 12:* That building on the achievements of the RNRRS, DFID should engage creatively with the programme managers and advisers, and overseas partners, to capitalise on the knowledge, experience and skills obtained and put these to effective use in the new research strategy.

## APPENDIX 35

### Memorandum from the Intermediate Technology Development Group

The Intermediate Technology Development Group is an international NGO whose mission is to help eradicate poverty in developing countries by developing and using technology, and by demonstrating results, sharing knowledge and influencing others. The organisation has over 30 years experience in supporting poor women and men in Latin America, Africa and Asia to access, use and adapt technologies that meet their needs. ITDG works with, and is supported by, DFID in the promotion of technology that is appropriate to the needs and priorities of poor people in developing countries.

#### *DFID does not have a clear position on science and technology*

1. ITDG is of the view that the Department for International Development does not have a clearly articulated policy, strategy or position on science, technology and innovation. A similar conclusion was reached in the review of DFID Funding of NGO Appropriate Technology Activities by Havers and Colley in 1998: "Overall it can be seen that DFID does not have a central overarching policy on appropriate technology." (5) Though this internal review, following DFID's refocusing on poverty reduction and marking the end of twenty years of the Appropriate Technology Project Fund (ATPF), was focused on "appropriate technology" the conclusion about organisational policy applied equally to all technology. The absence of an overall policy or approach means that there is therefore no framework for the Committee to consider "the use of science, technology and engineering in UK international development policy", nor for DFID to assess and address science and technology matters.

#### *Cancun's failure makes science co-operation more urgent*

Co-operation on science and technology must be at the heart of bilateral and regional agreements, although it needs to be handled carefully—*SciDev.net*, 19 September 2003.

#### A TIMELY INITIATIVE

##### *A need for a DFID policy on science and technology, with capacity building and funding*

2. ITDG welcomes the inquiry launched by the Science and Technology Committee. We would like to highlight for the Committee's consideration the need for:

- DFID to adopt an overall policy towards science and technology in poverty reduction;
- A focus on capacity building for science and technology in developing countries; and
- Increased public funding for technological research and development aimed at the needs and priorities of poor women and men.

#### *There is public anxiety about the rapid pace of technology and science*

3. It is entirely appropriate to consider science and technology in international development policy at a time when public policy debate, such as the Government's GM Nation, is dominated by questions concerning the social, human and environmental impacts of science and technology; and when the rapid rate of scientific and technological development, and the rapid diffusion of innovations, outpace social and political capacities to assess their actual and potential impacts. The inquiry is also particularly welcome following the reorganisation of DFID's Policy Division, where key science and engineering advisers have been located, and following the review of DFID research strategy. ITDG therefore welcomes the opportunity to submit comments to the Committee's inquiry.

#### A LACK OF AN OVERALL POLICY

##### *Two questions to address: 1. Extent of DFID policy; and 2. Degree of vision or proposition*

4. The Committee will need to address two preliminary questions before it can consider the specific questions set out in the notice inviting evidence. First, is the extent to which the UK Government's international development policy incorporates science and technology issues. The second, related question, is the degree to which there is a clear vision or proposition on the role of science and technology in poverty reduction within DFID.

5. The Government's policy on international development is set out in two White Papers (1997, 2000) and in the various policy documents of DFID. None of these policy documents is specifically about science and technology, though there are elements in most.

*Globalisation White Paper recognises role of technology*

6. The first White Paper refocused the Government's international development policy on poverty reduction, now articulated through the Millennium Development Goals. In the globalisation White Paper (2000) the importance of technology change for poverty reduction is recognised. The paper not only acknowledges that globalisation has been facilitated by the development of new technologies (17), but that technology change, through the diffusion of new ideas and knowledge, is essential for the elimination of poverty (105, 127). The paper also recognised that essential capabilities—health and education—are required for the advantages of new technologies to be achieved (45).

7. Subsequent Target Strategy Papers and Issue Papers have to varying degrees, directly or indirectly, covered matters concerning the use of science and technology for poverty reduction. It is not apparent from these that there is a coherent view of the processes through which technology and technical change contribute to DFID's objectives. The document Science and Innovation Strategy for DFID 2001–05, which set out the previous research strategy, suggests there is an overall policy, but does not present this.

## THE IMPORTANCE OF TECHNOLOGY

8. Yet, technology is a critical feature in human endeavour, livelihoods and culture. The lack of access to technology is a key facet of living in extreme poverty, and billions of people remain deprived of the most basic benefits of technologies that are centuries old. For example:

- 2 billion people still do not have access to modern, efficient forms of energy supply;
- 1.5 billion people still live in inadequate shelter;
- 1 billion people still have no access to safe water, and 2.4 billion have no sanitation; and
- 2.4 billion rely on wood/biomass for their main energy need, cooking.

9. Technical change has the potential to help millions of people in their daily struggle to survive. Small-scale technological changes can strengthen poor people's coping mechanisms in the face of vulnerability; for example, by helping them to prepare to cope with the effects of extreme weather conditions such as drought through water harvesting techniques and to enable them to later revive their livelihoods. Technology change can increase the productivity of micro- and small-scale enterprises, add value locally, improve product quality and diversity, reduce costs of raw material and energy requirements, and increase sales and incomes. Low-cost technologies for household level provision of water, sanitation and energy services can improve the supply and reduce the direct and indirect cost of basic services to households.

*Poor people can and do innovate. They need access to improved technology*

10. People living in poverty are energetic, entrepreneurial and skillful in the ways they pursue livelihoods from very limited assets drawing upon their own abilities, skills and knowledge and support from family, community and social networks. Innovation based on their indigenous knowledge and skills can and does take place, without support from the formal science community. However, access to improved technologies—which poor people can use in ways which are appropriate to their context and needs—can bring them better livelihood options, increase their productivity and incomes, improve the quality of the goods and services that they use, and enhance the quality of their lives.

*Development is dependent on technological and scientific knowledge*

11. There is increasing international recognition of the importance of science and technology for human development. The Dubai Declaration from the first conference on science and technology of the G77 said "We consider that more attention and new and additional resources should be devoted by the international community to developing countries' concerns, and uses of scientific knowledge appropriate to, and to the direct benefit of, the developing world. The Conference calls for greater recognition of the special needs of developing countries in science and technology". The World Bank's recent paper Strategic Approaches to Science and Technology in Development (April 2003) suggests that "development will increasingly depend on a country's ability to understand, interpret, select, adapt, use, transmit, diffuse, produce and commercialise scientific and technological knowledge in ways appropriate to its ambition and level of development."

## THE NEED TO REDIRECT RESEARCH

12. We need urgently to redirect scientific and technological development towards the public good, ie to addressing the needs of the third of humanity living in poverty, if we are to meet the Millennium Development Goals.

*Technological research and development dominated by private sector*

13. Certainly scientific and technological development could contribute more to poverty reduction and environmental conservation. But, as was highlighted in the UNDP's 2001 Human Development Report, there is an enormous gap between the resources devoted to technological R&D for markets in the industrialised world and those which address the needs of the poor in developing countries. In the 1990s public investment in research and development in science and technology stagnated while private funding increased five-fold—the most striking case being agricultural research.

*Stakeholders back global review of future agriculture*

A broad coalition agree to take part in the largest ever global dialogue on how to meet the world's future food—*SciDev.net*, 12 August 2003.

*Ten billion dollars is spent on private bio-technology research—but less than half a billion on public research for developing countries*

14. Agricultural research, for a sector that is central to the livelihoods of the majority of the world's poor, is neglected at national and international level and is especially lagging behind in developing countries. For every \$100 of agricultural GDP in 1995, industrial countries reinvested \$2.68 in public agricultural research and development; developing countries, just \$0.62. Funding, for the Consultative Group for International Agricultural Research (CGIAR) has continued to decline since its peak in 1992 and totalled \$336 million in 2000, along with a trend towards research that does not reflect the needs of poor farmers. Compare that to the \$10 billion invested annually in private agricultural research in the 1990s—biotechnology research alone being 25 times greater than the combined annual research budgets of the UN's network of agricultural research institutions. The forthcoming International Assessment of Science and Technology for Agriculture, initiated under World Bank auspices, presents an opportunity to reach international consensus on how to redress this trend.

CAPACITY BUILDING IN DEVELOPING COUNTRIES

15. Capacity building is required to establish national science and technology infrastructure (institutions and knowledge systems) in developing countries that is oriented to poverty reduction.

*Pace of technological advance outstrips capacity to regulate and control intellectual property*

16. The rate of technological development and the rate of spread of new technologies is now very rapid and an integral feature of globalisation. At the same time control over new technologies is retained, through the IPR regime, in the hands of a small number of global actors. The ability of national government, and international organisations, to assess the effects and consider the social and ethical dimensions of radical new technologies is outpaced by the rate of change. This is particularly true in developing countries where there is limited scientific and technological capacity within the government.

*India plans centre to train developing-world scientists*

India is to open its own research training centre in facilities being vacated by the closure of the COSTED programme of the ICSU—*SciDev.net*, 12 August 2003.

*Developing countries need their own science and technology strategies*

17. Though every country does not need to develop leading-edge technologies and undertake basic scientific research, every country does need domestic capacity to identify technology's potential benefits and to adapt new technology to its needs and constraints. Governments increasingly need R&D capability to enable them to regulate the acquisition and absorption of technology and in order to improve their own activities. Similarly capacity to engage in international policy making on science and technology issues, including trade issues, is needed.

18. Donors tend to fund research for two purposes—to build research capabilities in developing countries and to produce knowledge. An emphasis building scientific capabilities will result in more science, which may not address the practical needs of poor and their lack of access to well-understood technologies. Capacity building in science and technology that is oriented to poverty reduction would emphasise the strengthening of the technological capabilities of the poor and facilitate innovation and the management of technical change by them. It would establish an environment that enables poor people to exercise their own choice about technology.



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 NATIONAL SCIENCE AND TECHNOLOGY STRATEGIES

19. Developing country governments should be supported in the development and implementation of national strategies for science and technology that reflect the needs of the poor.

20. In the words of the 2001 Human Development Report, “Today’s technological transformations hinge on each country’s ability to unleash the creativity of its people, enabling them to understand their and master technology, to innovate and to adapt technology to their own needs and opportunities” (79). To guide this, developing countries need national policies and strategies for science and technology. Such policies should be integral to national poverty reduction strategies, which will require explicit consideration of science and technology in PRSP processes.

*Developing nations “must wise up to nanotechnology”*

Decision-makers in developing countries should look into the potential impact of nanotechnology on their economies and livelihoods—*SciDev.net*, 8 September 2003.

## A SCIENCE AND TECHNOLOGY POLICY FOR DFID

*DFID needs an overall science and technology policy if they are to assist developing countries*

21. To ensure that the UK’s international development policy and its aid funds contribute effectively to the formulation of appropriate policies and the development of necessary capabilities in developing countries, an overall approach or policy towards science and technology in development is needed. An overall policy towards science and technology would facilitate discussion on science and technology matters with recipient governments; it would help ensure strategic resource allocation on science and technology, centrally and across DFID country offices; and it would help DFID address technology issues in other policy arenas (eg trade) and with other departments of government.

*DFID’s focus should be on the technologies poor people use*

22. An overall approach consistent with DFID’s poverty focus and people-centred approach would not have a focus on the new technologies emerging from developed (or developing) country scientific research institutions, but embrace the full range of technologies actually used by poor people. It would seek to ensure that poor people are able to choose the technologies they want, and that they have the capability to assess, adopt, adapt and develop these technologies. This entails an approach to science and technology that starts with poor people and what they need from technology, not starting with technologies and applying them to poverty.

23. In adopting an overall approach to science and technology and poverty reduction, DFID’s policy would lead to support for:

- Strengthening the capability of people living in poverty to make their own decisions about the technologies that they want to use. In other words, improving their skills and knowledge to assess options and make future adaptations or incremental changes; ensuring access to resources to exercise choice; and giving them voice to influence policy and the institutional environment;
- Capacity building for institutions that will enable poor people to exercise their choice about technology (ie organisations that support poor people, provide information to them, supply technology to them and undertake R&D);
- Improving access to technological information and advice to policy makers, mediators and technology users; maintaining the public good nature of essential scientific and technical knowledge and removing barriers to access through inappropriate intellectual property rights regimes;
- The development and implementation of national science and technology innovation strategies. This would include national regulations that enable technology choice, and the capacity to negotiate on international regulations for the development and application of transformative new technologies; and
- Increased funding of poverty-focused technological R&D, eg through support to international, regional and national agencies. This should include the establishment of mechanisms to ensure that R&D is indeed demand-oriented and that the poor can influence the direction of research programmes.

*Pro-poor approach to science and technology is the crucial issue, other questions are secondary*

24. Adoption and application of an overall approach to science and technology in international development policy would steer aid for science and technology to the needs of poor people. The specific questions raised by the Committee are secondary to the overall vision of the how science and technology can contribute to poverty reduction. Indeed, this vision will determine the responses felt to be appropriate to the specific questions.

25. The question posed by the inquiry notice concerning whether a “relevant science base in developing countries” is being supported by UK Government international development policy, can be answered from the point of view of the approach towards science and technology that is poverty-focused. This is a question of applied scientific capability and the extent to which this is supporting and building on the innovations made by poor people themselves. The question “whether expertise in the UK science base is being utilised effectively”, should be judged on the same grounds. And similarly for the implications for the “maintenance of a science, technology and engineering capacity in the UK”. These last two questions are subsidiary to the need to build science, technology and engineering capacity in developing countries.

*Creating access to scientific information*

Bridging the information divide between rich and poor nations will require a fundamental rethink of the global knowledge economy—*SciDev.net*, 31 March 2003.

November 2003

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## APPENDIX 36

### Memorandum from Jonathan Cowie

1. Having worked with learned and professional scientific bodies for some two decades, and specifically in the area of science policy for over a decade, I have some understanding of how the UK biological community specifically, and the scientific community generally, perceives science policy issues. I currently serve on two policy committees, one for a specialist biological learned society and the other of a professional scientific body. However the comments below are made in purely a personal capacity although guidance has been sought from a UK science policy analyst as well as a UK biologist who has worked overseas in developing nations. As such I hope the Select Committee finds this submission helpful.

#### SUMMARY

2. Key points and questions include:

- (i) Compared to other Departments the DFID has done well with its science programme. However in common with other Departments it does not appear to have a coherent medium- (let alone long-) term goals strategy of its own or one that maximises cross-Departmental synergies;
- (ii) Has the DFID managed to develop a coherent investment strategy for R&D covering a period of a few research cycles (commonly viewed as three years)? For it is difficult to see how it can have as Governmental Expenditure in real terms on DFID R&D has fluctuated annually by up to 30% over the past decade;
- (iii) Why does the DFID feel it necessary to have a short-term and modest cash injection followed by two successive years of declining real-term budget? It is disconcerting to note that the Forward Look 2003 CSR plan for 2002–03 to 2004–05 is for the initial real-term increase of £8 million to decrease in subsequent years;
- (iv) How does the DFID agricultural, forestry and fishery policy interact with that of DEFRA’s R&D? The UK faces a number of agricultural issues that need urgent attention that—despite a couple of policy initiatives—have not been addressed. At the heart of these are several fundamental to other areas of Government policy that are also irreconcilably entwined with overseas development;
- (v) Similarly how does DFID meet policy commitments for biodiversity? UK systematics (the science of identifying and classifying species) is itself endangered as a discipline yet DFID (along with other Departments) could make good use of UK systematics resources; and
- (vi) How does the DFID involve the scientific community and scientific R&D administrators of other Departments in setting their agenda? The perception is that despite UK stated policy of developing “the most competitive and dynamic knowledge-based economy in the World” that science policy’s contribution to this is not “duly” appreciated either in investment or strategic terms with regards to “development writ large” on the international stage.

#### MAIN BODY OF RESPONSE

*DFID’s contribution to R&D is welcome but it does not make the most of this resource*

3. DFID’s contribution to UK R&D is most welcome and to be encouraged. Nonetheless, as shall be shown below: (a) DFID does not appear to make the most of this R&D resource, and (b) Government is not fully realising the synergies between science and policy goals in key areas. The Select Committee, in its announcement for this inquiry, is to be congratulated for looking beyond DFID as to whether the UK as

a whole is using science and technology effectively to realising stated policy goals. Reference shall be made below to just some key issues including: (example 1) sustainability with regards to food supply, (example 2) climate change and (example 3) biodiversity policies.

*DFID appears not to have a strategy covering one research cycle let alone more*

4. Given that the research tendering and completion cycle is typically three years, it is difficult to believe that DFID has a coherent strategy, or a realistic one, given that its R&D budget has regularly fluctuated in real-terms by as much as 30% over the past decade. There may well be a reason for this but if so it is not commonly appreciated. Indeed Forward Look 2003 indicates that after a modest increase next year, the two subsequent years will see a real-term decline in R&D investment. What policy goals will it be possible to achieve under such circumstances?

*Broad examples suggest that DFID does not appear to benefit from inter-Departmental synergies*

5. DFID does not appear to interact with other Departments as it might. Cross Departmental management of science is important for a variety of reasons. With specific regards to international development it is fundamental because the domestic remit of other Departments directly impacts on development overseas. There are inter-Departmental synergies to reap. *Example 1.* UK policy on food supply (such as it is) depends on a significant food import and sustainability. A recognisable proportion of UK food supply comes from developing countries so that the domestic policy and administrative environment DEFRA creates impacts on developing nations. *Example 2.* The UK has clear policy goals regarding climate change issues and notably took a lead on the international stage at Kyoto (1997). Given this, and that Europe is a net importer of some 475 million tonnes of oil a year the work of the DTI (which assumed the responsibilities of the former Department of Energy in 1991–92) affects development overseas. *Example 3.* The UK has stated that it is fully supportive of policies preserving biodiversity. The key scientific discipline used in assessing biodiversity is systematics, and here investment primarily comes from DEFRA and the Department of Culture, Media and Sports. Yet Departments (particularly DEFRA) have been highly reluctant to invest in systematics, which remains poorly supported and in somewhat of a limbo. Nonetheless the UK has inherited from more enlightened times a number of international centres of systematic excellence, which largely represent the last major bastions of this subject. It is therefore troubling that it is Departments with a domestic remit that are shouldering by far the bulk of this burden given that many of World's biodiversity hot spots are overseas and in less-developed nations. Were DFID to provide added investment to existing systematics support then it would be most welcome and could provide substantial R&D returns.

*Britain's policy and ecological footprints extend overseas. So domestic well-being depends on overseas interests necessitating involvement of domestic Departments as well as DFID*

6. The above examples all arise because Britain's policy and ecological footprints extend well beyond the nation's shores. Britain is politically active overseas and—if not because of—the area of ecosystem utilised to nurture the nation's economy equally extends well beyond these isles. Domestic activity and well-being is therefore in no small part founded overseas. Consequently it is important that international development concerns are addressed across Government, and that science (which is already meant to have pan-Departmental management through the OST) is deployed supportively to greatest effect by both Departments with domestic specialist interests and DFID reflecting these in international development.

*Systematics is a special case. Development of DFID R&D could do worse than begin here*

7. All the above examples (paragraph 5) are related to clearly recognized political aspirations. Though it is not for scientists *per se* to prioritise policy, but as stated one area of science, systematics, in particular is threatened by having fallen between funding stools and is in urgent need of attention. While it is not for the DFID alone to invest in systematics even though biodiversity conservation is clearly linked with local development, there are a number of rationales for DFID working with other Departments. For example, identifying novel crops such as tropical grasses and other carbon sources for use for biofuels (be they imported or grown domestically) necessitates both botanical systematists and experts in tropical agriculture. Such work would impinge on DEFRA and DTI policy implementation. Currently the investment made by DFID in systematics is negligible, and with regards to UK science as a whole the need for support in this area is acute. Systematics (which also relates to biodiversity concerns (“Example 3”, paragraph 5) is very much a special case and any future development of DFID R&D could do much worse than begin here.

*Concerns over UK systematics have been made by two Lords Select inquiries*

8. Concerns over investment in UK systematics, and the acute position that discipline finds itself in, have been made by two House of Lords Science & Technology Select Committee inquiries, the Dainton inquiry (1992) and its follow-up (2002).

*After systematics, agricultural and food-supply R&D is in need of attention especially as this has been cut from other Departmental R&D*

9. DFID's support for food supply development ("Example 1", paragraph 5) represents some 20% (£29 million) of DFID total R&D investment (£146.6 million) and this is welcome. However the perception on the ground is that this is (a) trivial in terms of the absolute amount required and (b) some agricultural scientists consider it having significant strings attached in that it can only be applied to projects DFID considered important and in certain countries. While DFID has every right to prioritise, the view from the agricultural science side of the fence is that this area is already suffering from over one and a half decades of real-term MAFF/DEFRA cuts of over £170 million (in 2001–02 money). After systematics DFID might consider reviewing its investment in agricultural and food-supply R&D.

*Agricultural R&D concerns have been raised by many including this Select Committee*

10. Concerns over the decline in investment in UK agricultural R&D have been raised many times before, including by the Science & Technology Committee perhaps most notably in its report Governmental Expenditure on R&D (2000). Since then matters have further deteriorated.

*Arguments for agricultural R&D cuts are misguided. There are reasons for further supporting agricultural research and ensuring a connection to international development*

11. It is worth noting that the argument of high EC agricultural subsidy has been promulgated by those within DEFRA as the reason why Governmental Department investment in agricultural R&D should be allowed to decline. Ironically this argument is related to international development as EC agricultural subsidies have impacted on the agricultural economies of some less-developed nations. If anything this is a Treasury argument and is at best misguided. (i) Agricultural R&D does not benefit from EC agricultural subsidies. One is science, the other is farming. (ii) There is a range of problems that necessitate scientific understanding from BSE, bovine TB, GM crops and foot and mouth etc. Indeed at the onset of the 2001 foot and mouth outbreak researchers usually funded by the Science Base were seconded to support DEFRA as the latter lacked its own expertise. It belies political claims that solutions to agriculturally-related problems are based on "best science" when that science has operated in an environment for over one and a half decades of real-term declining investment. (iii) While the Science Base is responsible for fundamental and blue skies research, Civil Departments have a duty to applied (other than near-market) and policy-driven research as well as monitoring. (iv) While agriculture only contributes to roughly 1% of UK GDP a further 2% is generated from the food and drink industry further down the supply chain. Also, shut down the countryside due to an agricultural incident (such as foot and mouth) and nearly the entire rural-based economy is affected including non-agricultural economies such as tourism. The GDP, let alone social, reverberations are considerable. (v) Finally, specifically relating to international development, the way the UK decides to feed itself from domestic sources impacts on overseas development as the sources of imports are, by definition overseas (see paragraph 6), and of course, as stated above EC subsidies affect some overseas agricultural economies. For these reasons better support for agricultural research is required and there needs to be some clear linkage (both investment and in policy terms) between agricultural R&D and the UK support for international development.

*DFID investment in energy-related climate change policy is less than 1% but the returns on a multi-million pound investment would be many fold*

12. It is difficult to identify where specifically DFID's investment is made from the broad summary given in Forward Look 2003, but expenditure on energy-related climate change policy ("Example 2" paragraph 5) has to be less than 1% assuming that all of DFID's £1.3 million energy expenditure were devoted to greenhouse friendly technologies. This is paltry and arguably derisory in terms of (a) Britain's political stance internationally, and (b) the size of the problem. Yet the costs of climate change to the UK and the benefits of being able to nurture greenhouse-friendly technologies domestically, even if they were deployed freely overseas, are such that the return on a multi-million pound investment would almost certainly be many fold. In policy terms this area of research is crucial. A number of developing countries have made it quite plain that they will develop regardless of whether or not the developed nations supply greenhouse-friendly technologies.

## CONCLUSIONS

*Becoming a competitive knowledge-based economy relies on investment in knowledge and linking that to other economies*

13. DFID does make use of science and this is most welcome. However its investment in R&D has fluctuated so betraying a lack of strategy. It also operates seemingly independently of other Departments whose own domestic remits clearly and directly relate to areas of DFID activity overseas. Both these suggest a lack of “joined-up” Government. They are part of a broader symptom whereby the contribution that science makes to the avowed policy goal of developing “the most competitive and dynamic knowledge-based economy in the World” is not fully recognised let alone with regards to development writ large on the international stage. That Parliamentary concerns over threatened areas of science that overlap with DFID’s R&D have been made before, but ignored, is disheartening to many of us in the scientific community. (One presumes it is also disheartening to the Parliamentarians involved) So how does the DFID involve the scientific community and scientific R&D administrators of other Departments in setting their agenda and in working together? Are these co-ordinating activities as effective as they might be? Finally there is the perennial question as to whether the Comprehensive Spending Reviews truly appreciate that if we are to develop “the most competitive and dynamic knowledge-based economy in the World” then we need to make at least a comparable investment as our competitors do if we are to overtake them and then to relate this new knowledge-based economy of ours to other economies, including less-developed ones.

## JOINED-UP GOVERNMENT LACKING

14. The above conclusion is not so much to decry the work of DFID but to point to problems in the management and financial environment in which DFID has to operate. Nor does this conclusion detract for the fact that the Government has gradually restored the real-term level of Government-funded R&D the nation enjoyed a decade and a half ago. But there is more to be done. The growing economy and developing science has moved on since then. The concerns in this response relate more to how science is managed across Government and to the continued under-investment in some core areas of science. As an issue joined-up Governmental management of science has also been raised before. Indeed Parliamentary concerns that Government Departments are failing to foster sound scientific foundations to policy formulation and implementation have been expressed on a number of occasions including three recent Commons Select Committee reports: *Are We Realising Our Potential?* (2001), *The Scientific Advisory System* (2001) and *Governmental Expenditure on R&D* (2000).

*November 2003*

## APPENDIX 37

**Memorandum from Alec Gaines, Strathclyde University**

## SUMMARY:

1. The report distinguishes developing countries such as Malawi where:
  - the consumption of protein;
  - the literacy; and
  - the average cash income
 do not meet the UN’s minimum standards and whose society needs protection, from transitional countries such as Thailand, Turkey and China that, although containing great poverty and still lacking adequate national facilities for health and education, nevertheless possess infrastructure, including scientific infrastructure, together with dynamic economies often able to compete in world markets.
2. Science can make major contributions to:
  - minimising conflict between neighbouring states and preserving security through the global monitoring of all major military movements and installations so that development can proceed undisturbed;
  - monitoring global and national environments thereby predicting harvests and giving warning of and quantifying such phenomena as floods, drought, forest fires and desertification;
  - producing new medicines for diseases endemic in developing and transitional countries;
  - setting up factories for cheap generic medicines;
  - revolutionising agriculture;
  - providing geological surveys to establish water resources and new sources of mineral wealth;
  - providing additional fuel resources especially sustainable resources essential to prevent enhanced global warming; and

- designing and commissioning novel, waste-free (and consequently pollution-free) industrial processes consuming the minimum of energy.

The implications for international poverty reduction are discussed.

3. In developing and transitional countries science is essential to:

- setting up an infrastructure that empowers states to grow from “developing” to “transitional”;
- setting up centres and networks for education and health, even on a village level;
- improving agriculture;
- establishing energy resources and electric transmission lines; and
- industrialisation.

4. Matters of ethics are touched upon throughout the report. It is pointed out that scientific education may change the nature of society in developing and transitional countries.

5. The science outlined in paragraphs 2 and 3 above provides open-ended opportunities for the participation of British commerce and industry in poverty reduction and international development. One can imagine an industrial service industry in Britain helping to design and commission sustainable, pollution-free factories, especially in such transitional countries as China.

6. The Department for International Development, the DFID, works through governments and in partnership with other donors to help programmes designed to achieve the internationally accepted “Millennium Development Goals”. The relevant “Country Strategy Papers” and “Country Assistance Plans” superficially ignore Science and contain little discussion of paragraphs 2 and 3. From a scientist’s or NGO’s viewpoint the Papers and Plans are not user-friendly.

7. On the other hand, the DFID funds half the projects of the major British NGOs engaged in international development and it is the only HMG instrument where international development, poverty reduction and achievement of the Millennium Development Goals are major aims of the research that is supported. The annual research budget is £80 million. The research programme is currently being rethought. 15 key research problems are being sought.

8. Research funded by bodies other than the DFID, such as the Research Councils, generally aims to produce international publications. This and the financial constraints under which universities and research institutions operate limits the efficacy of British research trying to solve problems of international development. The financial constraints on British Universities imply that it is more economic and efficient for developing and transitional countries to educate their own professionals than to send them to Britain.

9. The Department of Trade and Industry, the DTI, through “Trade Partners UK” produces “Country Profiles” of all developing and transitional countries. These Profiles are designed to facilitate exports. The Country Profiles, more user-friendly than the DFID’s “Country Strategy Papers and Country Assistance Plans” indicate fields of opportunity but they provide no lead-in to science and they have no direct relevance to poverty reduction.

10. There appears to be a need for “Rough Guides” for scientists, engineers, NGOs and business people that introduce the climate, geography and geology of each developing and transitional country, provide a flavour of each society, describe each poverty reduction strategy and its associated problems and supply indigenous contacts for future professional collaboration.

11. In practise it is the British Council that provides the gateway to British science and technology for developing and transitional countries. Until such time as this role becomes subsumed by the work of the UN Agencies, EU diplomatic offices or DFID Country Offices with scientific staff, it is essential that the British Council has a full-time Scientific Officer in each developing and transitional country.

12. Suggestions and questions for investigation by the Parliamentary Science and Technology Committee are summarised in Paragraph 14.

### 1. *Introduction: Limitations, scope and aims:*

1.1 This report is based on one male scientist’s experience of UK International Development Policy throughout the past 35 years. The author spent some 25 years of this period helping develop new or newish university departments of chemistry (and chemical oceanography) in two different societies: Thailand and Turkey. At the beginning of the period both Thailand and Turkey were formally “developing” (in terms of their protein intake, the percentage of the population who were illiterate and the average annual cash income per person and, like all developing countries, in needing protection from aggressive international trade). Both Thailand and Turkey are now “transitional” countries containing many poor and often ill-educated and unwell people but having dynamic economies, possessing scientific infrastructures, an important distinction between a developed and a transitional country, and able to stand on their own feet in the world market-place. (The university departments the author helped start or develop are all going concerns) Although Thailand and Turkey differ, they are both fortunate in being capable, should they so wish, of producing all the food they need. This is not true of all developing countries. Appendix 8 contains a brief CV of the author.

1.2 Thus, this report aims to provide a perspective for the Parliamentary Science and Technology Committee's inquiry as it is described in the Press Release of July 2003. The evidence provided is circumscribed in ways that paragraph 1.1 implies. Though most of the evidence is anecdotal suggestions are made, often in italics, of matters that the Parliamentary Science and Technology Committee, the Parliamentary Committee, might wish to pursue. Virtually all the suggestions would necessitate an increase in the UK's official Overseas Aid; the Parliamentary Committee may consider it timely that the UK should provide that 0.7% of gross national income that the UN has been requesting for the past thirty years. The report addresses aspects of all six of the specific points listed in the Press Release. These points have been listed from [1], the first in the Press Release, to [6] at the bottom of the Press Release and they have been referenced in this way throughout the report.

## 2. *The Department for International Development, DFID; Aims and Processes:*

2.1 "Her Majesty's Government's international promotion of science is co-ordinated by the Chief Scientific Advisor's Committee on Science and Technology. Its purpose is to assure the UK's publicly funded international activities in support of Science and Engineering achieve the maximum impact overseas and deliver the greatest possible scientific, political, cultural and economic benefit to the UK" [quoted from the British Council's web-site] There is a sub-committee, the Operational Managers Group, chaired by the Foreign and Commonwealth Office, the FCO. Of the members of this sub-committee, only the DFID aims to achieve international development and poverty reduction. The DFID is therefore the first public body to be considered in this report. Subsequently the report considers the work of the DTI, the OST, the FCO, the Royal Society and the British Council as each affects science and international development.

2.2 The DFID provides funds for the development of developing and transitional countries both to the countries themselves and within the UK. Whatever is written in the following paragraphs, the DFID's vision and its dedicated work are an inspiration. For a variety of reasons, including the avoidance of being colonialist, the DFID requests recipient countries to provide a "National Poverty Reduction Strategy". Help can be given in its compilation if needed. National Poverty Reduction Strategies do not appear to be generally available. The DFID's critiques of these Strategies together with the resulting DFID programmes and budgets of aid, "Country Strategy Papers" and "Country Assistance Plans", can be downloaded from the DFID web-site. Two are appended; for Malawi and China, so the Parliamentary Committee can taste their flavour. Generally the DFID does not fund "projects" (but see Paragraphs 4). It funds recipient government programmes that aim to achieve targets specified in the internationally accepted Millennium Development Goals. Wherever possible the DFID tries to do this in partnership with UN agencies, the World Bank, the EU and relevant NGOs. Note, however, that the DFID and the EU consider different selections of countries and their discussions of Poverty Reduction Strategies are not necessarily the same.

2.3 The Parliamentary Committee may think that in its emphasis on the Millennium Development Goals the DFID misses an essential point. Poverty reduction is not about economics, it is about the evolution of a society. The first requirement of the government of a developing country should be to know what sort of society the country has had and what sort of society the country wishes to become. The DFID should respect this wish. (The topic is missing from "Malawi" (Appendix 1) it is avoided in "China" (Appendix 2). Thailand has a clear vision of herself; Turkey continues to debate who she is)

2.4 The DFID appears to take a rather literal view of the Millennium Development Goals. There is no mention of "science" as such in Appendices 1 or 2. Superficially there appears to be little understanding of how technology can change a country; how a scientific infrastructure is essential to growing from being "developing" into being "transitional", or of how the development of a scientific society promotes human rights. (At a DFID Forum in Edinburgh in 2002, led by Clare Short and some of her senior civil servants, no DFID scientist appeared to be present even in the section on "Development and the Environment") Science is implied in the Country Strategy Papers in the sections on education, health and the reduction of poverty. The Parliamentary Committee may think the implication is often subtle. Sections on education contain little mention of teacher training, secondary or tertiary education (Only primary education is a Millennium Development Goal though it is difficult to see either how primary education can be expanded without increased teacher training or how the Millennium Development Goals of reducing infant mortality and the death of mothers in child-birth can be achieved without training medical workers, nurses and doctors.) The writing of the health programmes in the Country Strategy Papers suggests—perhaps incorrectly—little input from experts in Public Health. The development of energy resources, though essential to development, is not a Millennium Development Goal.

2.5 The Country Strategy Papers and the Country Assistance Plans, though downloadable from the DFID web-site are not user friendly. The Parliamentary Committee may feel that they give little insight into the nature of each country's society. It may seem difficult from reading the Papers and Plans for NGOs, commercial organisations, scientific bodies or private individuals to discern what specific opportunities exist for helping in development. The Parliamentary Committee might consider it worthwhile to check which foreign embassies and consulates in Britain possess staff competent to discuss such opportunities with enquirers. (Thus, Turkey, a transitional country intensely concerned about its scientific and technological development as yet possesses no diplomats with a scientific education above that acquired in secondary school)

3. *The first parenthesis; Large-scale Science and Engineering:*

3.1 This parenthesis is inserted to give perspective to the work of the DFID. Some extra detail is provided in the paragraphs on Thailand, Malawi, Turkey and China.

3.2 The Ministry of Defence, the FCO and the DFID control a significant joint budget to facilitate conflict resolution, peace keeping and peace building and the DFID considers a peaceful nation to be an essential pre-requisite of development. [FCO, "The Global Conflict Prevention Pool", 2003] One suggests that all countries (all peoples) should have access to high resolution satellite imagery showing the world's major military movements and installations. Today, only the USA appears to possess such imagery and this is made public but rarely. The Parliamentary Committee may feel that the construction of a European satellite providing imagery to the UN's Secretary General would be a major contribution to minimising conflict in Africa and Asia and throughout the world.

3.3 Three African countries run satellites capable of providing environmental information. NASA maintains low resolution satellites (eg Landsat, SEAWIFS) for this purpose and the Parliamentary Committee may consider that Britain should ensure that all developing and transitional countries be funded and trained (if necessary) so that they can utilise the NASA systems. The imagery would provide information essential to understanding climate change, daily weather, predicting harvests on land and sea, desertification, deforestation, forest fires, flooding and so forth. The imagery could be an essential tool for government.

3.4 Few developing or transitional countries enjoy a systematic geological survey. The Parliamentary Committee might care to recommend that there should be a complete survey of ground and surface waters (and of their quality) in all developing and transitional countries. Wherever there is an extensive Tertiary geology a map showing the concentrations of all metals (say every 10km) should also be produced so that new sources of wealth might be unearthed. Given populations enthusiastic to help in sampling, such geological exploration may not be expensive.

3.5 The Parliamentary Committee may desire to encourage programmes to find medicines for major diseases endemic in developing countries especially where the opportunities for profit do not attract the private sector in developed countries. (AIDS and Malaria are already receiving attention but insufficient attention) There is a need for aid programmes to encourage the creation of laboratories and factories for the cheap production of generic medicines in developing and transitional countries. (The Parliamentary Committee may consider the insulin factory operated by NovoNordisk in southern Africa to be a model of what can be achieved. The company appears to pay proper attention to the health and safety of its employees, makes a small profit for the shareholders and sells insulin to the peoples of southern Africa at much less than the going price in Europe)

3.6 Sustainable development requires sustainable energy. The reduction of poverty implies the utilisation of additional resources of energy. The Parliamentary Committee may consider that all developing and transitional countries without exception should promote solar energy, wind power, hydroelectricity and wave power. (Controlled nuclear fusion would revolutionise the world) The transmission of electricity may require encouragement.

3.7 As with energy all factories in developing and transitional countries should be sustainable. There is no reason why these countries should adopt the old fashioned, pollution creating factories established in the developed world. The Parliamentary Committee might recommend all countries in transition to aim at being world leaders in sophisticated industrial design. The Committee may decide that it is urgent to set up large scale programmes to boost "Green Chemistry".

3.8 Major programmes in "Soil Science" and Agriculture are needed to sustain many developing countries (thus, the "Green Revolution") and the Parliamentary Committee may think that collaboration with such programmes in developing and transitional countries could be exciting. Once one starts thinking like this the possibilities are endless. Obviously any and every programme must be designed rigorously.

3.9 The growth of a country from developing to transitional requires the development of a scientific infrastructure capable of managing the construction of roads, railways and airways; with centres working with farmers to improve methods of agriculture; with laboratories to monitor that medicine and food are up to standard and to underpin all facets of health; with National Councils to encourage the development of relevant technology; of tertiary education and of national hospitals, and capable of initiating geological and geographical surveys. The totality of the teaching required to foster scientific infrastructures in all developing countries forms a significant industry.

3.10 Little of the previous paragraphs will be successful if it is imposed by the developed world. All projects must be assimilable. Projects have to be initiated by developing and transitional countries in a form adapted to local conditions. All overseas workers in developing countries require previous training. Such workers have to be able to live and communicate in their new environment and for the first six months of their sojourn they should carry out their duties, try to earn respect and friendship and show no initiative [New Scientist, page 532, June 1970].



#### 4. *The Department for International Development; NGOs and Research:*

4.1 Besides its direct support of Government Poverty Reduction Programmes, the DFID provides up to 50% of the money (in Sweden the fraction would be 80%) needed by 11–15 of the largest British NGOs committed to projects targeted at Millennium Development Goals. The DFID's Challenge Fund will supply up to £100,000 for smaller scale NGO activity. Most of the remainder of the funding of NGO projects arises from donations from individual members of the public. NGOs dedicated to the natural environment and others such as Medecins Sans Frontieres have scientists amongst their executive, other NGOs consult scientific advice as and when they think they need it. The Parliamentary Committee may wish to consider the scientific content of NGO international projects more deeply. The author has had no direct contact with British NGOs during his work in either Thailand or Turkey.

4.2 In addition the DFID has been supporting research, not all of it scientific research, in the sectors of water, transport, energy, earthworks, urbanisation and infrastructure, IT and health care. These sectors have been both centred on organisations (eg the British Geological Survey, "Harwell", Loughborough University) and scattered around Britain. Most of the research activities had partners outside Britain. The total DFID research budget was £80 million a year, somewhat more than the total the DFID spends in some developing countries. DFID Newsletters and house magazines describe the progress of the research. Appendix 3 provides a list of "Current and new projects in the DFID's KAR Water Sector Programme (May 2003)" to ensure the Parliamentary Committee has an example of what was being attempted.

4.3 The past tense has been used in Paragraph 4.2 since the DFID's research is now being reorganised. "Research will come under a Central Research Group which will move towards strengthening the following three areas

- research products which are more of an international effort;
- research aimed at the country level and at in-country demand;
- blue sky research".

15 "key research problems" are being sought, notably through workshops organised by:

- The Development Studies Association;
- The Tropical Agriculture Association and the Institute of Civil Engineers; and
- The Royal Society for Tropical Medicine and Hygiene.

The 15 research programmes should meet the following criteria:

- the issue is crucial to the achievement of the Millennium Development Goals;
- it requires long term research;
- it requires an international scale of research effort; and
- it is an issue where the DFID's involvement will make a difference.

The deadline for suggestions was 30 September 2003. The budget of £80 million is expected to increase. The Parliamentary Committee will wish to know the DFID's future research programme. It is the only research programme sponsored by HMG that fosters international development [quotations are from the DFID web-site].

#### 5. *A second parenthesis; Science and Society, Science and Human Rights:*

5.1 A sound scientific education should imbue one with a spirit that takes no dogma for granted. Ultimately everything is open to challenge. One performs the experiment and one draws one's own conclusions. This may inspire, if not a healthy distrust of authority, at least a gentle, professional scepticism. This spirit becomes incorporated into the empathy that is generated between members of a scientific team as they work to accomplish their objective. A good scientific education, apparently devoid of all political content, is inevitably an introduction to participatory democracy. The author has argued that the support that the British Government gave over a period of several years to the development of science in Turkey was its greatest contribution to the defence of human rights in Turkey. The British Government should be proud of this. NATO appears to feel similarly. NATO's "Science for Stability" and "Science for Peace" programmes included, for example, a major project studying the Black Sea environment in which scientists from different institutions in virtually all the riparian countries were funded to overcome the barriers enforced by their different nationalities and to work together. Those who live in developing and transitional countries should be aware that, whatever its technological implications, the development of science may change their society.

#### 6. *The Office for Science and Technology, the OST:*

6.1 The OST has little direct impact on international development (Though it was involved recently in setting up scientific links with China. The budget is small). The OST's major impact is through the Research Councils that it funds.

7. *A third parenthesis; Factors limiting the impact of British research and scientific training on international development:*

7.1 The DFID is the only institution of HMG that has international development as a research objective.

- The present Research Assessment of British universities gives no credit for research into poverty reduction as such. Simplifying, credit is given for research that generates many publications in refereed. International Journals. Such an outcome is unlikely for most of the water research projects, for example, supported by the DFID (Appendix 3). This will diminish the motivation of academics towards such projects.
- Fees charged overseas students by British universities greatly exceed fees charged by countries such as France and Germany. In the USA it is normal for overseas university students to be provided with part-time work. Both the FCO and many British universities offer a limited number of competitive scholarships (but how is a student from a developing country to show an academic record proving s/he is better than anyone else around?). Unless there is a great increase in the number of these scholarships Britain will be unable to help the numbers she might. Given significant fees, of the order of £5,000 and £9,000 for undergraduates and graduates, respectively, and given the need for subsistence, health care and transport, it is inevitably cheaper, and often more efficient, many transitional countries having reasonable academic standards, for would-be professionals to obtain their education in their home developing or transitional country than to come to Britain. Many British academics, realising this, have become indifferent to helping developing and transitional countries. The Parliamentary Committee might care to compare the numbers of students from developing and transitional countries receiving tertiary education in Britain with the numbers receiving tertiary education in their home country and note the changes during the past two decades.
- Insufficient attention is paid in Britain to providing students from developing countries with research problems and training that can be extended by the students when they return home.
- Little is done to ensure that relevant facilities await the student on their return to their home developing country.
- Few university supervisors in engineering or in the physical and life sciences continue worthwhile collaboration with former students from developing and transitional countries (Japanese and Australian supervisors appear better at this). Thus, the ODA, as the DFID then was, financed 14 science graduates from Chiang Mai University (The first university to be set up in Thailand outside Bangkok) to enable them to obtain doctorates from the University of Aston. A few other science graduates from Chiang Mai were supported at other British universities. All students were successful and returned as lecturers to Chiang Mai I know of no lecturers who gave worthwhile help to Chiang Mai University after their student(s) had returned. This was shameful.
- Relatively few academic scientists and engineers in Britain appear to have sufficient flair or insight to perceive the challenges in applied science offered by phenomena in developing and transitional countries. Thus, one notes that it is American Universities that are currently exploring the sediments below the African Great Lakes.

8. *The Department of Trade and Industry, the DTI*

8.1 The DTI, through “Trade Partners UK” provide “Country Profiles” of essentially all developing and transitional countries. These can be down-loaded from the web-site. Selected sheets from the Country Profiles of Thailand, Malawi, Turkey and China are appended so that the Parliamentary Committee can see what they are like. Doubtless, the Parliamentary Committee will wish to down-load, study and correlate further Country Profiles. The purpose of the Country Profiles is solely to facilitate exports by British commerce and industry. The Profiles provide a summary of the economics of the country concerned; they don’t tell one how to behave but they do provide contacts, not entirely with persons at the DTI and the appropriate British Embassy. The Profiles list the needs of each country in the form of “opportunities” and the lists distinguish between the comparative dullness, from the export point of view, of trade with developing countries and the dynamism of trade with transitional countries where economic growth and industrial design may be ahead of anything in the developed world and will continue to be so in the future. One assumes all entrepreneurs can appreciate the opportunities for large scale construction and for scientific and engineering trade that may, and do, exist in each transitional country. (This is an assumption. One year the British taxpayer spent £60 million to equip all the first year undergraduate science and engineering laboratories in Turkey with British apparatus. It remains incredible that no British manufacturer followed this up to sell advanced or research equipment in Turkey)

8.2 Trade Partner UK’s Country Profiles contain no introduction to the Research and Development Councils of the countries concerned. There is little in the profiles about Health and Safety, about Quality Control or about Quality Assurance and very little about reduction of poverty and the achievement of the Millennium Development Goals. There is little discussion of ethics. The Parliamentary Committee may feel there to be a clear need to provide British industry and commerce with “Rough Guides” adumbrating the

geography, geology, climate, both physical and sociological, of developing and transitional countries and introducing their national poverty reduction strategies and the measures to improve their education, health, literacy and so forth in such a way that all British entrepreneurs can experience the satisfaction of participating in international development. The DTI may have to educate industry and commerce in the moral necessity of participating in the societies to which they export. In Thailand generosity is a quality of leadership. The Islamic tradition in Turkey prescribes charity and all significant Turkish companies set up Charitable Trusts. British multinationals such as BP and Unilever are major exceptions. One understands British firms to subscribe to the Chevening scholarships awarded by the FCO but one knows of no significant contribution by any British Company to the provision of education, health and poverty reduction in Turkey.

8.3 Sections in the Country Profiles on “The Environmental Market” are almost entirely devoted to “end-of-pipe” operations to clean up pollution by obsolescent factories. The idea that we should be collaborating in the excitement of designing, commissioning and operating sustainable factories that create no pollution, and little waste of any sort, has evidently failed to get through to the DTI. The Parliamentary Committee may consider this to be appalling.

8.4 The DTI may sometimes encourage major projects in developing and transitional countries. There being little discussion of ethics in the Country Profiles, the real evaluation of major projects may occur before a Parliamentary Select Committee. A significant example was the construction of the large Ilisu dam in south eastern Turkey [House of Commons Trade and Industry Committee, Sixth Report, 28 February 2000]. The Ilisu dam, one of a number of dams constructed or being constructed in the south east of Turkey as part of the GAP project to redevelop a portion of the ancient “Fertile Crescent” and reduce poverty, increase education, improve health and so forth, was opposed for a variety of reasons notably by the Kurdish diaspora. It may be considered no bad thing for the matter to be threshed out before a House of Commons Committee but the Parliamentary Committee may argue that, given the opportunities transitional countries afford for large engineering projects, the DTI needs to widen the discussion of the environmental impact of these projects.

#### 9. *The Foreign and Commonwealth Office, the Royal Society and the British Council:*

9.1 The Foreign and Commonwealth Office, FCO, appears to have no Scientific Attaches in developing countries and but three in transitional countries (China, India and Korea) though Scientific Attaches may also take up posts in Brazil and South Africa in the near future. “The FCO posts are primarily responsible for reporting back to the UK on developments in-country and science policy issues at the government level. The FCO focuses on wealth creation” [British Council web-site].

9.2 The DFID, the only government department whose sponsored scientific research focuses on international development, has a number of regional and country offices and officers. The Parliamentary Committee may wish to examine their competence to discuss scientific matters.

9.3 The Royal Society establishes collaborative bi-national programmes, generally exchange programmes, with corresponding national scientific associations (eg the Turkish Council for Scientific and Technological Research, TUBITAK), most recently, China. Budgets are limited. There is little collaboration with developing countries though one hopes members of the Royal Society inform their colleagues of the various natural phenomena, many needing advanced study, that may be observed. The Parliamentary Committee might care to investigate whether the experience the Royal Society can call upon of advising governments and of consulting with the scientific civil service and so forth appears to be underutilised in international development. Such Professional Societies as the Royal Society and the Royal Society of Chemistry might care to ensure that institutions of tertiary education in developing countries can afford access to such electronic forms of scientific journals as “Science Direct”. The Parliamentary Committee may wish to investigate the magnitude of the problem.

9.4 In practise the main source of access to British Science for a developing or transitional country is the British Council. The British Council operates under the aegis of the FCO, the Director or Representative in each country commonly having the official status of Cultural Attache. In each country the British Council has a number of budgets for each separate sector of activity such as “Human Rights” and “Science”. The Council can, at least in principle, obtain and help others to obtain, budgets from outside sources such as the World Bank. The British Council web-site gives more detail of the size of the science budget and of related discussions with the FCO.

9.5 The British Council is a shop-front for British education, it provides FCO scholarships, probably in numbers that are grossly insufficient to meet the demand. It fosters “Academic Links” including scientific Academic Links in developing and transitional countries which, if they facilitate the achievement of the Millennium Development Goals, may be funded by the DFID. Academic Links are essentially exchange programmes, usually tolerably well funded but rarely more than this. Depending on circumstances, including the enthusiasm of the Director, the British Council may find budgets for large projects (see the paragraphs on Turkey for some examples). The Parliamentary Committee will doubtless wish to study the full extent of the Academic Links and the major scientific activities administered by the British Council in developing and transitional countries.

9.6 The British Council receives scientific advice from its scientific unit at Bridgewater House in Manchester and their consultants. It has or had a number of Scientific Officers. This isn't good enough. For most scientists, technologists, doctors, engineers in developing and transitional countries the British Council is their gateway, sometimes their only gateway, to British Science. Until such time as this function is taken over by a UN Agency or by the European Commission then, in the absence of a DFID Country Office, the Parliamentary Committee may consider it to be essential that the British Council has a Scientific Officer in each developing and transitional country. Such an Officer has to be able to talk on terms of scientific equality with Ministers, civil servants, members of the National Scientific Council and so forth. Such an Officer has to make him or herself available to all leading and promising members of the scientific community throughout the developing or transitional country. This may or may not generate "Big Science" but it will certainly generate projects of practical importance to development that will otherwise be missed or neglected.

#### 10. *Illustrations from Thailand:*

10.1 Thailand: Thailand is now a transitional country that no longer merits a Country Strategy Paper though the DFID supports several projects and Academic Links. Part of Trade Partners UK Country Profile is appended. For the past 50 years Thailand has possessed a clear conception of where she wants to go. She grew out of being a developing country essentially by following UN advice. Whilst so doing she received meaningful aid from several countries and institutions including the ODA (as the DFID then was). Thailand's establishment of primary schools in every village and subsequently of health centres in every village, of roads, of public—especially village—education about family planning and public health and, more recently, about HIV/AIDS are noteworthy and should be better known. There is much that could be utilised as models for development elsewhere. Thai development was underpinned by a centuries old culture of education and of generosity, both of money and of spirit, by the educated.

10.2 As a transitional country with an infra structure, Thailand now offers many development opportunities both in the private and in the public sectors. Many UN Agencies have centres in Bangkok and Thailand has become a natural location from which to help SE Asia. As the Country Profile makes clear, education, including scientific and technological education continues expanding. The Parliamentary Committee may find there is a great need to improve workshop and laboratory facilities. The Thai Open Universities—there is more than one—attract literally millions of students and produce thousands of graduates. Thai science, though still backward, is now at the stage where PhD programmes are being initiated. Collaboration might be welcome and, in subjects such as plant biochemistry and aquaculture, exciting. "Golden Jubilee" Scholarships are available to finance the participation of Thai science students in collaborative doctoral programmes. Thailand produces cheap generic medicines and the Parliamentary Committee may wish to encourage her to export them. Perhaps surprisingly, there appears to be no centre in Thailand that receives regular satellite imagery of the environment. Thai Tertiary geology remains incompletely known; there may well be further mineral wealth to be discovered. There are profound environmental problems. The water table in the north appears to be falling steadily, possibly as a consequence of deforestation. Although water is Thailand's life blood there are still too few laboratories capable of monitoring water quality. The Gulf of Thailand appears insufficiently monitored and there is a danger of pollution from the industry burgeoning along its coast. Air pollution in Bangkok can still be appalling. Most of the environmental opportunities specified by Trade Partners UK are end-of-pipe solutions to problems of pollution. The much more significant opportunity is in promulgating "Green Chemistry" and "Green Chemical Engineering" and the design of industrial processes that produce no waste and utilise the minimum of energy. There is surprisingly little utilisation of solar energy.

10.3 It should always be remembered that whereas Thai society is unfailingly courteous, astonishingly graceful and intensely sympathetic, like many developing and transitional societies, it remains alien to Britain. Careful, hard thought is required if collaboration is to be successful.

#### 11. *Illustrations from Malawi:*

11.1 Malawi is a developing country in terms of protein intake, literacy and average cash income. Though the country is agricultural, irregular droughts cause shortages of food. The staple crop is maize. All the problems of a developing country are compounded by horrendous depredation by HIV/AIDS. Voluntary workers from Britain speak of a "missing generation", the relatively young parents who are dead or slowly dying leaving illiterate grand-parents to do what they can for the children. Neither the DFID Country Assistance Plan nor the Country Profile issued by Trade Partners UK (Appendices 1 and 5) provide understanding of what it feels like to live in Malawi or comprehension of what Malawi society could be like in twenty or fifty years time.

11.2 The DFID is justly proud of possessing the largest aid office in Malawi and uses its good offices to work in partnership with other agencies. Perhaps through oversight, the Country Assistance Plan contains little mention of collaboration within southern Africa (for example, in environmental health problems). The DFID's top-down approach through the Malawi government is hampered by the comparative lack of infrastructure within Malawi. Malawi's most valuable resource should be the unused potential of the intelligence of its relatively uneducated population.

11.3 Note the term “should be” in the previous sentence. The Parliamentary Committee may feel that the intelligence of the Malawi population cannot be exploited whilst HIV/AIDS remains rampant and consequently such illnesses as TB and malaria prove fatal more frequently than they should. The Parliamentary Committee may wish to examine whether the provision of cheap medicine and medical facilities is not the most important scientific problem facing southern Africa. The distribution of medical facilities and drugs and the accompanying public education implies an associated development of infrastructure and the establishment of local health centres—perhaps to accompany the provision of primary schools. Much might be learned from the development of Thailand.

11.4 Should the urgent, dramatic health problems be overcome, then one looks forward to the development of education including secondary and tertiary education and teacher training. Such education will empower Malawi. Again, much might be learned from Thailand. Major scientific projects might include the investigation of the causes of drought; improvement in agricultural productivity particularly in the cultivation of maize, and the delineation of the geology of Malawi.

## 12. *Illustrations from Turkey:*

12.1 Turkey is another country that has pulled herself up from being “developing” to being “transitional”. The Parliamentary Committee will wish to note that she did this whilst protecting her economy. For many years the importation of goods could be banned if they could be produced in Turkey. It was only when Turkey felt capable of standing on her own two feet that she embraced free trade.

12.2 Turkey has yet to determine where she is going: it an experimental science, so to speak. There is still much poverty and hardship. Public Health could be—and is being—much improved. Education, particularly secondary and tertiary education continues to be extended in response to popular demand. Human Rights still need defending. Nevertheless, there is an infrastructure, there is parliamentary democracy of many year’s standing and there is dynamism. Economic growth may exceed that of anywhere in Europe.

12.3 The infrastructure includes a scientific infrastructure. “Science” pronounced Kemal Ataturk, “is the leader of men” and intellectual discussion in Turkey, both in the media and by the woman in the street is a scientific discussion to a much greater extent than in Britain. A scientific civil service has yet to be established but the President employs scientists to brief him before he makes state visits abroad. The National Scientific and Technological Research Council, TUBITAK, is part of the Prime Minister’s Office; it has a formal relationship with Britain’s Royal Society. Natural gas pipelines and dams for hydroelectricity powered Turkey into the Twentieth Century. Solar energy became the people’s power throughout the Mediterranean coastlands. In the Cukurova and Icel regions, empowered by the agricultural extension teaching of Cukurova University, agriculture developed very significantly and the UN is now promoting a clean textile industry. One looks forward to observing similar development in the south-eastern region. The present government is genuinely concerned to preserve the Turkish environment. Istanbul boasts possibly the largest detergent factory in Europe, a factory that recycles its water and creates no liquid wastes. As Trade Partners UK indicate (Appendix 6) the possibilities for large scale collaboration are endless.

12.4 No country has done more than Britain to encourage Turkish Science. Recognising the position of science in Turkish society the British Council in Turkey was one of the first branches of the Council to appoint a Science Officer. Successive Science Officers built up a portfolio of 30 Academic Links between Britain and Turkey. Major projects have included the equipment of virtually all the undergraduate science and engineering laboratories (£60 million) and the provision of advanced teaching for technicians in the textile industry. However, during the present decade, at least partly due to budgetary constraints, the position of Science Officer has been discontinued. During this period Turkish scientists became members of the editorial boards of international scientific journals; Turkey co-ordinated NATO’s Science for Peace and Science for Stability Programmes in the Black Sea, and today, whilst she is not allowed to vote, Turkey is otherwise a full participant in the European Union’s Scientific Programme. Turkish laboratories can participate in and co-ordinate projects like laboratories anywhere in Europe. Turkey is now running a space satellite. British laboratories should be aware of the possibilities inherent in having Turkish partners. It is incredible there appears no longer to be a British diplomat capable of talking meaningfully with leading Turkish scientists and scientific administrators.

## 13. *Illustrations from China:*

13.1 China used to receive “Aid and Trade” support, for example, for transport infrastructure and waste and waste-water treatment. Such support was (presumably) completed in 2002. Now the DFID operates to help the poor and to achieve Millennium Development Goals (Appendix 2). The total DFID budget for China is of the same order of magnitude as that for Malawi—about 2.5p per head of the Chinese population. China is an enormous, populous, dynamic transitional country embracing several different climates, geologies and ethnicities. Like many (most? all?) transitional countries there is often poverty. China being populous, there is much poverty. There are now some 30 million Chinese living on less than \$1 dollar a day. Most of these live in agricultural areas and it is three of these areas, the provinces of Sichuan, Yunnan and Gansu, that the DFID has decided to help. The help is administered from Beijing. Following DFID

philosophy the help is not project oriented but is supplied by working through agreed programmes with the Chinese government. There is clear emphasis on working in partnership with the UN and other large donors—so that the DFID’s modest contribution becomes part of a larger whole.

13.2 There is no mention of Science as such in the Country Strategy Paper. As in Malawi, science is implied under education, health and agriculture. Superficially, the Country Strategy Paper appears to disregard certain activities essential to sustainable development, eg secondary and tertiary education; energy. It may be thought that the choices made by the DFID are arbitrary. Given its partnerships with larger donors the DFID activity appears sound. Nevertheless, the dynamism and changeability of Chinese society imply the possibility that in 50 years time Britain may look back and say that our money was irrelevant or wasted. Furthermore, given the smallness of the DFID budget comparative to the size and needs of China, the budget might have been spent in a myriad other ways, eg by supplying scholarships to enable some of the poorest to pursue currently unaffordable secondary and tertiary education in China.

13.3 “The local and foreign private sector has a key role to play in making globalisation work for the poor. In China the sector accounts for more than a third of GDP. Trade related and foreign investment flows are hugely more significant than . . . is aid . . . We do not envisage providing significant support for . . . trade . . . but we will continue to influence . . . trade . . . so that poor people benefit” . In the context of the size of China this quotation from the Country Strategy Paper (Appendix 2) may be thought to be the heart of the matter. Although one may feel that Trade Partners UK’s Country Profile is woefully lacking in vision, it does make clear that there are endless opportunities for large scale projects and for “big science” China needs collaborative help in virtually every field of activity one can think of: agriculture, soil science (there is an enormous problem of the natural shifting of topsoil throughout central China) mining, energy, geology, industry, transport, waste treatment, water resources, water treatment . . . everywhere. The size and population of China means each of the problems is enormous. As this report has already stated, there is no reason why Chinese industry should adopt the obsolescent techniques beloved of the developed world. In some areas, the construction of dams and of domestic buildings for example [see Harvard Design School Project on the City, “The great leap forward”, Taschen 2001], China is already more sophisticated than we are. Nevertheless, the Parliamentary Committee may imagine new industries in Britain devoted to collaborative design of projects for the sustainable development of China.

13.4 Consider the energy sector as an example to illustrate the last paragraph. Table 1 shows the annual energy consumption per head of population in various parts of the world.

**Table 1**

ENERGY CONSUMPTION PER HEAD OF POPULATION IN 1981  
(TONS OF COAL EQUIVALENT)

<i>USA</i>	<i>UK</i>	<i>USSR</i>	<i>CHINA</i>	<i>INDIA</i>
10.2	4.6	5.7	0.6	0.2

These statistics, though obviously out of date, appear to be latest the UN has produced; the Parliamentary Committee should satisfy itself that more recent figures lead to the same conclusions as those in the text.

It will be observed that each person in China consumed but an eighth of the energy consumed by a person in Britain. This is a distinction between a developing and a developed country. If it may be assumed that China will wish for the same standard of comfort as in Europe one expects her to attain the same consumption of energy per head of population as rapidly as possible. There are some two billion people in China and only about an eighth of this in Europe. Should Chinese energy be produced by the combustion of fossil fuels then the consequent “new” production of carbon dioxide will be about eight times the present production by Europe (about four times the production by the USA). In comparison the proposed reductions in carbon dioxide production put forward at Kyoto are small. Viewed in this way, the development of China is almost certain to produce extensive global warming (The USA is alleged to produce about three-quarters of the global domestic and industrial production of carbon dioxide. One is therefore contemplating a three-fold increase in the global emission of carbon dioxide). The climate of Britain will be changed. The Mediterranean will remain inhabitable only through ubiquitous air conditioning and the desalination of sea water. The Parliamentary Committee may think that China should be encouraged and helped to develop large scale facilities for hydroelectricity (as, of course she is doing), solar energy and wind energy. One is writing about billion dollar (or euro) industries. The UK has yet to demonstrate that it is able to operate on this scale in China. The Parliamentary Committee may suppose that one can write in the same way about other fields of activity that call for large scale collaborative projects to be undertaken in China. Britain’s capacity to undertake such collaboration may be limited and the Parliamentary Committee may consider there to be a need to establish some priorities.

14. *Compilation of suggestions and questions for consideration:*

1. UK official overseas aid should be raised to 0.7% of gross national income (paragraph 1.2);
2. Does the DFID respect a developing country's desire to be itself? (paragraph 2.3);
3. Should there be more discussion of the relation of science to development in the DFID's Country Strategy Papers? (paragraph 2.4);
4. Do developing and transitional countries have embassies possessing staff capable of discussing specific development needs with British enquirers? (paragraph 2.5);
5. A satellite producing high-resolution imagery of military movements and installations and responsible to the UN's Secretary General would minimise global conflict (paragraph 3.2);
6. All developing and transitional countries should be trained and funded to utilise NASA satellites monitoring the environment (paragraph 3.3);
7. All developing and transitional countries should possess a geological survey showing their water sources and mineral wealth (paragraph 3.4);
8. Research to find medicines for major diseases in developing and transitional countries should be encouraged (paragraph 3.5);
9. The creation of laboratories and factories for the cheap production of generic medicines in developing and transitional countries should be encouraged (paragraph 3.5);
10. Could more be learned from the successful operations of NovoNordisk in southern Africa? (paragraph 3.5);
11. Promotion of non-fossil fuel energy resources in developing and transitional countries should be encouraged (paragraph 3.6);
12. All transitional countries should aim at being world leaders in sophisticated industrial design (paragraph 3.7);
13. There is a need to boost "Green Chemistry" (paragraph 3.7);
14. British collaboration with developing and transitional countries in the fields of soil science and agriculture would be exciting (paragraph 3.8);
15. Are NGOs getting sufficient scientific advice? (paragraph 4.1);
16. The Parliamentary Committee will wish to know the DFID's future research programmes (paragraph 4.3);
17. Limitations on the impact on international development by British research and scientific training (paragraph 7.1);
18. Are "Rough Guides" needed that adumbrate the geography, geology, climate, both physical and sociological of developing and transitional countries and describe national poverty reduction strategies and the specific measures to needed to improve education, health and so forth so that British entrepreneurs may readily participate in international development? (paragraph 8.2);
19. Does the DTI know about the design of pollution-free industry? (paragraph 8.3);
20. Should the DTI widen the discussion of the environmental impact of large scale projects? (paragraph 8.4);
21. Do DFID Country Offices have adequate scientific staff? (paragraph 9.2);
22. Is the Royal Society's experience of advising governments and their administrators underutilised in international development? (paragraph 9.3);
23. The Royal Society and British professional societies might ensure developing and transitional countries can afford electronic access to the world's scientific journals (paragraph 9.3);
24. The British Council should have a Scientific Officer in every developing and transitional country (paragraph 9.6);
25. The mortality and despair caused by HIV/AIDs is such that the provision of cheap medicine and of medical facilities is the most important scientific problem facing southern Africa (paragraph 11.3);
26. Can one imagine new industries in Britain devoted to collaborative design of projects for the sustainable development of China? (paragraph 13.3);
27. China should be encouraged and helped to develop large scale facilities for the development of hydroelectricity, solar energy and wind energy (paragraph 13.4); and
28. The needs and opportunities in China are larger than Britain alone could satisfy. There is a need to establish priorities (paragraph 13.4).

## APPENDIX 38

**Memorandum from the Royal Entomological Society**

The Royal Entomological Society (RES), founded in 1833, is a scientific society instituted for the improvement and diffusion of entomological science. It currently has almost 1,800 Fellows and Members, some 30% of whom are based overseas, many of them in developing countries. Many past and present Fellows of the RES have made significant advances in insect science that have either underpinned or directly contributed to the UK's impact in international development activities. The evidence presented below is focused on the Society's interest and experience in the role of entomological science in support of international development in the renewable natural resources sector, especially concerning agricultural pests, disease vectors, forestry pests, pests of food and other commodities, and environmental biodiversity. In presenting this evidence we have assumed that the concerns of the House of Commons Science and Technology Committee are with the use of science in the conventional sense of branches of the natural sciences—chemistry, biology, physics, mathematics—more than the social sciences of sociology, anthropology and economics. Within the natural life sciences, the decline of systematic biology in the UK has concerned many RES Fellows for some years. This has been the subject of an inquiry by the House of Lords Science and Technology Committee: the Society has submitted evidence<sup>24</sup> to that Committee and has commented<sup>25</sup> on the Government's response to that Committee's report.

## HISTORICAL BACKGROUND

1. The UK has a long history of scientific endeavour relating to the discovery, development and conservation of natural resources in developing countries. In the 18th and 19th centuries, private collectors and explorer-scientists, such as former RES Fellows Charles Darwin and Alfred Russel Wallace, travelled widely in the tropics and subtropics. Their activities focused on specimen collecting and the recording of variation, rather than on the possible benefits to the countries they visited, but some of the principles they deduced from their observations had far-reaching impacts on our scientific understanding<sup>26</sup> and many of the collections dramatically expanded our knowledge of biodiversity and systematics.

2. The Victorian era saw increased commitment by the UK Government in supporting such scientific activities. With the support of William Gladstone, the Superintendent of the natural history departments of the British Museum (Professor Richard Owen) persuaded the Government to establish a new natural history museum in South Kensington. The new museum eventually opened to the public in 1881 and the move of the collections from Bloomsbury was completed in 1883.

3. Nearby, the Imperial Institute was opened in 1887 as a research and educational base for the Empire, and its Scientific and Technical Department was created in 1894 to identify and promote new uses for natural products from the then British Colonies. The Institute itself was closed in the mid-1950s but its institutional legacy includes: a large part of the scientific arm of the former ODM/ODA<sup>27</sup> in its first three decades, and now embodied in the Natural Resources Institute (NRI) of the University of Greenwich; former components of the present CAB International (CABI); and the Commonwealth Institute, amongst other related institutions.

4. In general, these scientific resources directed at natural resource development in developing countries experienced:

- a decline through the second quarter of the Twentieth century with the retraction of Empire;
- a crossover in the 1950s with the disbandment of the outmoded Imperial Institute but the emergence and success of expanding entities such as the Anti-Locust Research Centre<sup>28</sup> and the Tropical Products Institute;
- an impetus from 1964 after the creation of a Government department (ODM/ODA) specifically focused on overseas aid;
- a period of substantial and confident scientific output through the 1970s and 1980s when technology transfer was seen as a key mechanism for development; and
- a steady decline, over the past decade and a half, in the role of natural science and technology in UK international development policy.

<sup>24</sup> As described by Claridge, M. (2002) *Systematic Biology and Biodiversity*. *Antenna* 26(2): 86–88.

<sup>25</sup> As described by Haines, C. (2003) *What on Earth? RES Comments on the Government Response*. *Antenna* 27(3): 158–161.

<sup>26</sup> For example: Darwin and Wallace's joint discovery of a theory of evolution through natural variation and selection; Wallace's discovery of the boundary (now known as the Wallace Line) within South-East Asia between two entirely different floral and faunal biogeographical systems, long before the Twentieth Century theory of plate tectonics would explain its origin; and the major botanical collections of Sir Joseph Banks, donated to the British Museum in the eighteenth century.

<sup>27</sup> Ministry of Overseas Development/Overseas Development Administration.

<sup>28</sup> Which in the early 1970s expanded its remit and became the Centre for Overseas Pest Research, subsequently merging with the Tropical Products Institute in 1983 to form the Tropical Development and Research Institute.



## CO-ORDINATION OF RESEARCH BETWEEN GOVERNMENT DEPARTMENTS AND OTHER BODIES

5. Although agriculture has featured less prominently than previously in ODA and DFID<sup>29</sup> reports and policy focus over the past decade, most of the developing countries targeted for assistance by DFID have economies in which agriculture is a major contributor to GDP, and a substantial proportion of the UK's R&D and technology transfer for development has been in the agricultural and related natural resources sectors. A significant proportion of UK expertise supporting ODA/DFID work in tropical agriculture has been based in individuals or teams with prior or parallel experience working for MAFF/DEFRA. It is also pertinent that the Darwin Initiative, the small grants programme that aims to promote biodiversity conservation and sustainable use of resources in less developed countries, is funded and administered not by DFID but by DEFRA.<sup>30</sup> It is therefore surprising that DEFRA is not listed in the Committee's invitation of evidence as a body with which co-ordination might be expected in relation to Government policy on the use of science in development policy. However, although there are undoubtedly "grass-roots" connections—at the level of individuals and teams in both public and private sectors—between agricultural technology developments in the UK and in developing countries, the RES is not aware of any formal mechanism to facilitate the identification and transfer of appropriate technologies between DEFRA and DFID.

6. RES Fellows who have contributed to this consultation, including those who have served or are still serving on Advisory Committees for the DFID Renewable Natural Resources Research Programmes, are not aware that the Government has a stated policy on the use of science in international development. The Society is therefore unable to comment objectively on the co-ordination of research support with Government policy on this issue, either within DFID or between DFID and the other bodies mentioned in the Inquiry invitation.

7. In its first two decades, when technology transfer and technical cooperation were seen as key drivers of the development process, the former ODM/ODA explicitly referred to its support of relevant UK scientific endeavour and expertise as part of its role. In its annual report for 1986, ODA<sup>31</sup>—in a chapter headed "Science, Research and Development"—reported that "ODA-financed research and development (R&D) in science and technology provides new knowledge and techniques to assist economic and social progress in developing countries. The ODA gives priority to R&D projects which will especially benefit the poor countries, and particularly their rural areas. In doing so it draws on the scientific and technological resources available in British institutions and on guidance from its own full-time professional advisers. Complementary R&D activities are carried out under the aid programme at the ODA's own Scientific Units and associated bodies". In addition to this chapter, the same report included a three-page article on "Pest Control and Plant Protection in Africa", which highlighted several examples of successful R&D on pest management undertaken by ODA scientists based at its Tropical Research and Development Institute.

8. Through the 1990s, R&D and scientific innovation, especially in relation to agriculture and other natural resources, were given decreasing prominence in ODA/DFID's annual reports and policy statements. The 1997 White Paper<sup>32</sup> referred to partnerships with the scientific community in the UK and internationally, and to the underpinning value of knowledge, research and technology, but did not set out a strategic policy for the use of science in development other than an emphasis on the principle of shared knowledge (panel 18, page 48). This important White Paper made just three references to natural resources (as a component of natural capital, as needing sustainable management and as requiring proper stewardship) and almost all the references to agriculture were related to issues of trade liberalization.

9. By the year 1999–2000, DFID in its annual report<sup>33</sup> was making an undefined distinction between research and knowledge generation. The same report noted DFID's hosting of a symposium on *Eliminating Poverty: The Value of Science to Rural Livelihoods*, which showcased the results and impact of DFID's research work in the renewable natural resources sector. In 2003, however, DFID's latest annual report<sup>34</sup> makes just one overt reference to science (concerning new maize varieties developed by scientists at the International Maize and Wheat Improvement Center in Mexico, plus two similar research activities in breeding sweetpotato and chickpea varieties) and four references to technology (relating to constraints of patenting regimes, new technologies for education, rainwater harvesting, and information technology for DFID's in-house management). From the RES's viewpoint of interest in the application of entomology to the management of insect pests and disease vectors, it is noteworthy that all the 2003 report has to say on this subject is that "... in India, DFID-supported research by the International Crops Research Institute for the Semi-Arid Tropics has led to ... the use of natural insecticides in place of chemicals." From this report, one might infer that science and technology *per se* are no longer seen as of core relevance to the Government's international development policy and activities.<sup>35</sup>

<sup>29</sup> Department for International Development.

<sup>30</sup> Ministry of Agriculture, Fisheries and Food/Department for Environment, Food & Rural Affairs.

<sup>31</sup> ODA (1987) *British Overseas Aid 1986: Annual Review*. Overseas Development Administration: London, UK. 80 pp.

<sup>32</sup> DFID (1997) *Eliminating World Poverty: A Challenge for the Twenty-first Century*. White Paper on International Development, Cm 3789. London, UK. 82 pp.

<sup>33</sup> DFID (2000) *Departmental Report 2000*. The Stationery Office Limited: London, UK. 172 pp.

<sup>34</sup> Chapters 1 to 6 of DFID's 2003 annual report at [http://www.dfid.gov.uk/Pubs/files/dr2003\\_default.htm](http://www.dfid.gov.uk/Pubs/files/dr2003_default.htm)

<sup>35</sup> Concerns about this trend—in relation to agriculture—were expressed in the recently published findings of the Select Committee for International Development on its inquiry into the DFID 2003 Report (International Development Committee eighth Report, HC 825).

## ACQUISITION AND USE OF SCIENTIFIC ADVICE

10. In the field of renewable natural resources (agriculture, food, fisheries, livestock, forestry) in which our Society has most interest and experience, there has been a long history of ODM/ODA/DFID-supported R&D activity with the potential to provide a source of scientific advice for the Government's development policies. In the 1970s and 1980s, the largest component of this was the corps of 350–400 civil-service scientists and engineers who worked for ODM/ODA itself and were based in the various scientific units of the ministry. The research programmes of these scientific units were monitored with a "light touch" by the ministry's natural resources advisers, themselves former active scientists, and by external advisers including senior developing-country representatives. Most significantly, ODM/ODA provided the scientific units with core funding for their scientists to answer enquiries and to undertake minor investigations on request either from ODM/ODA's natural resources advisers and geographical desk officers, or from scientific institutions in developing countries. However, although this arrangement indubitably facilitated quick responses to specific scientific questions, it is doubtful that it contributed to discussion of development science policy issues. The Society is not aware of where ODM/ODA sought scientific advice in that era on matters falling outside the remit of its own scientific units, but assumes this would have been largely through the individual professional contacts of its senior advisers in the ministry's headquarters.

11. With the transformation of the former scientific units to an Executive Agency (the Natural Resources Institute, NRI) in 1990, the downsizing and subsequent privatization of NRI in the mid-1990s, and the contracting-out of management of the renewable natural resources (RNR) research programmes in the second half of the 1990s, the resource of scientific advice directly available to DFID in this sector has been both reduced in volume and distanced in accessibility by formal customer-contractor relationships. In the RNR sector, DFID now clearly looks to the Research Programme Managers, their Advisory Committees, and other key players in the Programmes, as their source of scientific advice. This narrower focus, at a level relevant to policy rather than operations, has the potential to serve DFID better than the former system of open access to the project scientists, though this may be dependent on the extent to which individual natural resources advisers and rural livelihoods advisers feel that they have ownership of the RNR research strategy and are thus willing to promote its outputs. The Society is also concerned to note that the post of Chief Natural Resources Adviser (or an equivalent professional post) has been discontinued and that there now seems to be no spokesperson for the natural sciences in DFID's senior management team.

## RESEARCH AND INNOVATION RELATED TO COUNTRY-LEVEL DEVELOPMENT PROGRAMMES

12. In its report<sup>36</sup> on British overseas aid in 1986, ODA stated "The ODA's R&D vote finances research work of regional or global application. Research for the benefit of individual countries is funded as part of its country aid programmes." The report makes no reference to the existence of any linkage or feedback loops between the two. The RES is not aware that this situation has changed in recent years and believes that there is still poor linkage between sectoral research and geographical development programmes.

## BUILDING CAPACITY IN DEVELOPING COUNTRIES

13. In the RNR sector, the RES is not aware of any major advances in UK efforts to build scientific, technological and engineering capacity in developing countries, whether to help them to overcome trade restrictions (as specifically noted by the Committee) or to give them the technical capability to compete in an open international market. In this sector, technical cooperation projects to enhance the scientific capability of technological institutions in developing countries appear to have declined rapidly in the late 1980s and have continued to diminish steadily since then.

14. As noted above, one area in which the UK has historically had pre-eminent expertise relevant to natural resources is the core biological discipline of systematics (including alpha-taxonomy<sup>37</sup>). In earlier years, ODM/ODA funded research in this area, either overtly and directly, or as an ancillary component of applied entomology programmes. In the late 1980s, ODA support for such research fell away. Surprisingly, following the signing of Agenda 21 at Rio in 1992, with its commitment to environmental issues and maintenance of biodiversity (in which the RES has a particular interest), the UK has substantially reduced its support of the systematic sciences that underpin research on biodiversity. The Natural History Museum retains a deservedly high profile in this area, but it has lost the substantial scientific expertise of CABI's entomological taxonomists, who were made redundant in spite of their specific interest and experience in the economically and environmentally important insects of developing countries.

## ROLE OF PRIVATE SECTOR AND PUBLIC/PRIVATE PARTNERSHIPS

15. The Society has no comments to offer on this matter, other than to note that the UK itself has not yet resolved the questions of public/private partnerships concerning issues of public good versus commercial profit, especially in relation to the Society's entomological interests in the management of renewable natural resources in relation to agriculture, food, fisheries, forestry, livestock, health and the environment.

<sup>36</sup> ODA (1987) *British Overseas Aid 1986: Annual Review*. Overseas Development Administration: London, UK. 80 pp.

<sup>37</sup> The naming and description of new species: a scientific activity essential to the description of ecological communities, the conservation of biodiversity, and the management of pests and disease vectors.

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 SCIENTIFIC AND ENGINEERING TRAINING

16. The annual reports of ODM/ODA/DFID in past years have used differing measures and categories of training provided by the UK for international development. It is thus impossible to make any objective analysis of the extent of this training, whether by analysis of expenditure, student-years, academic level, sector or subject area.

17. However, the experience of RES Fellows is that scientific training in international development for developing-country students in the RNR sector has suffered considerable decline in the past decade or more. In the past five years, several relevant post-experience and post-graduate courses at UK universities have ceased to run—not because of a lack of interest from potential students from eligible countries, but because the applicants cannot obtain funding from DFID or other donors to attend courses specifically designed for the needs of scientists and technologists from developing countries. RES Fellows have also noted a decline in the numbers of developing-country applicants, with funding, for postgraduate research degrees in entomological subjects.

## CONCLUDING REMARKS

18. In preparing this document, the opinions and contributions of many RES Fellows and Members were sought and received. The document, however, does not necessarily represent the views of all Fellows and Members of the Society.

19. Our submission concentrates on the role of the “mainstream” natural sciences in the UK’s international development effort, since this is perceived to be the main focus for the Science and Technology Committee, and particularly on the Society’s interest in the science of entomology in relation to agriculture, food, fisheries, forestry, livestock, health and environment. In highlighting the substantial decline in the use of natural science and technology in the UK Government’s international development programme in recent years, the Royal Entomological Society makes no judgement on whether this is related to an apparently increased focus and expenditure on the social sciences.

20. In spite of the evident decline in UK funding for scientific R&D in international development, and the associated shrinkage of the UK skill base in this area, the UK’s development scientists continue to achieve honours for the quality of their work. For example: RES Fellow Dr Stephen Torr recently won an award as lead author of the best paper (on the use of DNA fingerprinting to identify the preferences of tsetse flies for individual cattle) published in the Society’s journal *Medical and Veterinary Entomology* during 2001–02; the current RES President, Prof. Chris Haines, led the NRI team of post-harvest technologists that won a Queen’s Anniversary Prize in 2000 for its work on food security in the developing world; and RES Honorary Fellow Dr Glyn Vale was a finalist in the Environment section of this year’s World Technology Awards for his work on environmentally-safe control of tsetse flies in Zimbabwe.

21. However, the Society is seriously concerned about the decline in the UK’s resource base in entomology, not only in relation to international development but more widely. The last two decades have seen a major reduction in investment in scientific skills and physical resources for entomological R&D related to: pests of agriculture, horticulture and forestry; vectors of medical/veterinary diseases; and insect communities as an essential component of environmental biodiversity. The diminishing role of natural science and technology in the UK’s international development policy appears to be part of a wider malaise affecting UK life sciences that needs to be addressed urgently if the UK is to play as significant a role in future global development as it has in the past.

*November 2003*

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 APPENDIX 39

**Memorandum from the Natural Resources Institute, University of Greenwich**

## SUMMARY AND KEY MESSAGES

(i) This submission focuses on natural and social science and technology in support of agriculture, food, natural resources and rural development. Returns on investment in science and technology (S&T) for development are high and can have a significant impact on global hunger, health, and poverty outcomes as well as global trade.

(ii) The UK has a comparative advantage in S&T for development. Scope exists to improve the strategic planning and management of current multiple public funding sources and the alignment to development outcomes. No formal mechanism exists within the UK for the coordination of the programmes of the various government agencies on the use of S&T for development.

*It is recommended* that consideration be given to the appointment of a Chief Scientific Advisor in DFID and to the establishment of an external advisory committee on S&T for development, mandated to provide vision, leadership and direction within both the UK, including across agencies, and within the international arena.

(iii) The UK capacity to support S&T for development has eroded dramatically and is likely to continue to do so. Centres of excellence with their appropriate physical and human infrastructure cannot be maintained. There exists a poor institutional environment for effective acquisition and use of scientific outputs and advice with the current contractual relationship between UK S&T base and DFID.

*It is recommended* that the government reconsider its relationship with the UK science base for development and that the current customer and contractor relationship be revisited. A more equitable partnership for the provision of advice needs to be put in place.

(iv) A strong public sector active in S&T is essential within developing countries to ensure pro-poor outcomes of technology generation as well as to enable an effective and equitable partnership with the global and local private sector.

*It is recommended* that the UK strengthen its contribution to secure sustainable national and regional public sector research systems within the developing world.

(v) The UK has strong public and private sector competence and capacity to support developing countries to take advantage of trade opportunities.

*It is recommended* that new models be developed to support developing countries in exploiting trade opportunities, learning from experiences of other development agencies and fostering greater use of public and private sector capacity.

(vi) There has been a reduction in the numbers of developing country personnel being trained under UK funding in the fields of agriculture and related sciences.

*It is recommended* that new models to support human development/capacity building of the public and private sectors in developing countries, be developed and supported.

(vii) DFID makes significant investment to S&T. However, the continuum of research through to development outcome could usefully be strengthened.

*It is recommended* that DFID put in place a structured learning process to benefit from its past investment in S&T and to seek better means to link S&T within country programmes.

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## SECTION A ORGANIZATION SUBMITTING

*Natural Resources Institute, University of Greenwich*

1. The Natural Resources Institute (NRI) is a specialist Institute of the University of Greenwich providing research, consultancy, training and advisory services to underpin sustainable development, economic growth and poverty reduction. The majority of activities focus on the harnessing of natural and human capital for the benefit of developing countries, though much of the Institute's expertise has proved to be of growing relevance to industrialised nations. It is the largest single UK source of such expertise.

2. The Institute maintains a programme of research and technology generation in life sciences, social sciences and economics. Funding is on a full cost-recovery basis with total research funding in the order of £5 million (2002–03), approximately half from UK central government, primarily DFID, and the other main sources of funding being international agencies, other bilateral aid donors and private sector. Since NRI joined the University of Greenwich, over 70 post-graduate students have been registered for research degrees, a high proportion of these from developing countries. Research also underpins postgraduate programmes in natural resources, food safety, and food technology management, as well as short courses in specialized areas carried out both in the UK and overseas. The quality of the research was recognized in the 2001 Research Assessment Exercise of the Higher Education Funding Council for England (HEFCE). NRI-led research projects won the annual DFID Research Prize in 1999 and again in 2000 and the Institute was awarded a Queen's Anniversary Prize for Higher and Further Education in 2000 for its research, advice and training on improving food security in the developing countries. The NRI is registered to ISO 9001:2000 for quality management.

3. Each year NRI staff undertake around 600 professional overseas assignments in over 80 countries (mainly in the developing world or in countries with transitional economies) as consultants, researchers, advisors or educators.

## SECTION B STATEMENT ON SCIENCE AND TECHNOLOGY FOR AGRICULTURE, FOOD, NATURAL RESOURCES MANAGEMENT AND RURAL DEVELOPMENT

*Importance of Science and Technology in Agriculture, Food, Natural Resources and rural development to the Achievement of the Millennium Development Goals (MDGs)*

4. There are compelling reasons why agriculture, food and natural resource-related science and technology are important for the achievement of the MDGs. Over 70% of the world's poor live in rural areas and depend heavily on natural resources and agriculture for their livelihood and food security.<sup>38 39</sup> Out of the eight MDGs, the achievement of the following are directly affected by national and international science and technology capacity in agriculture, food, natural resources and rural development.

5. *Halve Extreme Poverty and Hunger by 2015*. Although, over the past two decades, the world has made considerable progress in increasing food production and reducing food insecurity, progress has slowed during the 1990s (Von Braun et al, 2003).<sup>40</sup> In particular, if China is not taken into account, the number of food insecure people in the rest of the developing world increased by 50 million during the last decade. In Sub-Saharan Africa alone, the population living in hunger increased by about 20%, with 30 million more food insecure people by the end of the decade. The conclusion is that the world is not food secure, and that the challenges ahead are more complex than previously thought. Without significant changes in policies, institutions, and public and private sector investments, it will be impossible to achieve the MDG of reducing extreme poverty and hunger by at least half by 2015.

6. Reflecting on this challenge, the Plan of Implementation of the World Summit on Sustainable Development (2002)<sup>41</sup> states that "agriculture plays a crucial role in addressing the needs of a growing global population and is inextricably linked to poverty eradication, especially in developing countries", calling, amongst other things, for a reversal of the declining trend in public sector finance for sustainable agriculture and for the provision of appropriate technical and financial assistance (pages 29–30). The section on Sustainable Development for Africa further states the need for "technology development, transfer and diffusion to Africa and further develop technology and knowledge available in African centres of excellence", as well as the need for "support of African countries in developing effective science and technology institutions and research activities capable of developing and adapting to world class

<sup>38</sup> Message of the United Nations Assembly President, Jan Kavan (Czech Republic), marking the International Day for the Eradication of Poverty, 17 October 2002.

<sup>39</sup> World Bank (2003) Reaching the Rural Poor: A renewed strategy for rural development. ISBN 0-8213-5459-0.

<sup>40</sup> According to the FAO, the number of food-insecure people in developing countries fell from 920 million in 1980 to 799 million in 1999 (the last year for which data were available). Joachim von Braun with Maria Soledad Bos, Mary Ashby Brown, Sarah A Cline, Marc J Cohen, Rajul Pandya-Lorch, and Mark W Rosegrant (2003), Overview of the World Food Situation—Food Security: New Risks and New Opportunities; Brief prepared for the Annual General Meeting of the Consultative Group on International Agricultural Research, Nairobi, 29 October 2003.

<sup>41</sup> United Nations (2002), Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August–4 September 2002.

technologies” (pages 43–44). The World Bank’s new rural development strategy (2003) specifically calls for renewed international effort to address poverty in rural areas including the S&T which underpins that change.

7. In addition to the reduction of hunger, agricultural production is important to poverty alleviation in that it creates spin-off effects through upstream and downstream linkages with the non-farm sector (Davis 2003; Haggblade et al 2002; Reardon et al 1998).<sup>42</sup> In an analysis of 35 countries it was noted that a 1% increase in agricultural GDP per capita led to a 1.61% gain in the per capita incomes of the lowest-income fifth of the population (Timmer 1997<sup>43</sup>). The rural non-farm economy has been recognised as an important creator of employment and income. This too requires support from S&T.

8. Agricultural production also makes an important contribution to urban poverty alleviation, in that “lower food prices are a fundamental contribution to increasing the welfare of the 300 million urban people who live in absolute poverty and that spend very large proportions of their meagre income on food” (Berdegue and Escobar, 2001, p19).<sup>44</sup> The same authors demonstrate the importance of agricultural innovation but stress also that the environment must be conducive for innovations to succeed.

9. Parallel to agricultural production, it is essential that food science and marketing systems keep up with ever evolving trade and consumer requirements in a globalised market place. For example, this may be expressed through food safety regulations for internationally traded horticultural or fisheries products, or the increasing importance of corporate responsibility in international business. Consumption of nutritious and safe food has health implications that are related to the other MDGs.

10. *Ensure Environmental Sustainability.* The targets associated with this MDG refer to mainstreaming the environment in policy and programmes, reversing the loss of environmental resources, and improving access to environmental services. In particular, this refers to climate change, desertification, biodiversity, and forest and water management. It is recognised that there are strong linkages between this MDG and the others, in that addressing environmental issues would help to achieve the other goals, and achieving the other goals would help to ensure environmental sustainability.

11. Science and technology have an important role to play in view of the environmentally related changes that are taking place, at a fast pace, in both developing and industrialised countries. This is taken into account in the Plan of Implementation of the World Summit on Sustainable Development, which recommends the development and dissemination of related technological innovations, highlighting at the same time the need for capacity building.

#### *Global investment in S&T*

12. Many farmers in developing countries struggle to produce food crops in poor environmental conditions with few tools to cope with drought, pests and disease. Whilst there have been significant gains from the “green revolution” technology largely for farmers located in favourable agro-ecological zones, S&T must move beyond the “green revolution” to reach the many farmers who did not benefit from it and to secure and enhance the gains of those who did, within a globalization world. Low income countries invest less than 0.5% of the agricultural gross domestic product in agricultural research compared to 2–5% in industrialized countries.<sup>45</sup> Internal rates of return on investment in agricultural research are high and have been estimated at 73%<sup>46</sup> (although the range of 30–50% is considered by many to be more realistic). However, the true impact on poverty reduction remains open to further inquiry. It is recognized that technology alone cannot reduce poverty.<sup>47</sup>

13. In 2002, the World Bank initiated an International Assessment on the role of Agricultural Science and Technology in Reducing Hunger and Improving Rural Livelihoods<sup>48</sup>, in response to explicit demands for an assessment (eg Kofi Annan /InterAcademy Council on Food for Africa; The New Partnership for Africa Development) and the implicit needs including social concerns about technology. This process has included a series of international consultations, and will now be taken forward with multi-donor funding to a technical implementation phase.

<sup>42</sup> Davis, JR. (2003), *The Rural Non-Farm Economy, Livelihoods, and Diversification: Issues and options.* Report 1, DFID unpublished mimeo. Haggblade, S Hazell P, and Reardon T (2002) *Strategies for Stimulating Poverty Alleviating Growth in the Rural Non-farm Economy in Developing Countries*, Paper prepared for the World Bank, March 25, 2002, International Food Policy Research Institute, Washington DC—unpublished mimeo. Reardon T, Stamoulis K, Cruz ME, Balisacan A, Berdegue J, and Banks B (1998), *Rural Non-Farm Income in Developing Countries. The state of food and agriculture 1998: Part III*, Rome, Food and Agriculture Organization of the United Nations. Website: <http://www.fao.org/docrep/w9500e>

<sup>43</sup> Timmer, CP. (1997) *How well do the poor connect to the growth process? Consulting assistance on Economic Reform Discussion Paper No 178.* Cambridge MA: Harvard Institute for International Development.

<sup>44</sup> J A Berdegue and G Escobar (2001) *Agricultural Knowledge and Information Systems and Poverty Reduction*, AKIS Discussion Paper, World Bank website 2003.

<sup>45</sup> IFPRI (1995) *A 2020 Vision for Food and Agriculture and the Environment.* IFPRI, Washington DC 50pp.

<sup>46</sup> Alston, J, Marra, M, Pardey, P, and Wyatt, T. (1998) *Research returns: a meta-analysis of the returns to agricultural R&D.* EPTD Discussion paper, No 38 IFPRI Washington DC.

<sup>47</sup> Henderson, S. (2001) *Natural Resources Research: Impact assessment and poverty.* NRI Policy Series 10. 41 pp.

<sup>48</sup> See <http://www.agassessment.org/>

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*The case for UK S&T to support this field*

14. The UK has over the years demonstrated leadership in international S&T for development including holding significant influence on the Consultative Group for International Agricultural Research (CGIAR). There exists, within the UK, a cadre of expertise of international standing in S&T for development. These factors combined with a recognition that support to agriculture and related science research provide high rates of return on investment, continue to indicate that S&T is a good investment choice.

15. Many of the topics of current research need relate to increasing productivity and to trade and as such touch on public health, economic, social, ethical and environmental issues, all themes close to the interests of the UK tax payer and consumer. A case to support science and technology may therefore be built around both the UK's self interest including economic benefits as well securing the benefits for the poor in the developing world.

16. Without a strong UK S&T base, the UK's capacity to influence the international debate including key issues in global science and technology policy will be undermined and thus reduced.

## SECTION C RESPONSE TO INVITATION FOR EVIDENCE ON SPECIFIC ASPECTS

### *C.1 The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and the DFID*

#### *Funding and organisation of science and technology in the UK:*

17. In 2000–01, the United Kingdom's budget for civil research and development was £4.2 billion<sup>49</sup>. This represents a significantly lower proportion of gross domestic product than for several other member countries of the Organisation for Economic Co-operation and Development. The figure of £4.2 billion includes the "science budget" allocated to the Research Councils, research funds to universities channelled through the Higher Education Funding Councils and the research and development budgets of the civil departments. The allocation to civil government departments for research and development in 2000–01 was £1.4 billion, of which the share of the Department for International Development (DFID) was £121 million. The breakdown of DFID research expenditure was £76 million on centrally-funded research, £11 million on central policy analysis and £33 million by country and regional programmes.

18. There is no formal central structure for establishing research priorities across government departments, but the government's Chief Scientific Adviser and its Chief Social Researcher provide a strategic overview. The Department of Trade and Industry (DTI) is responsible for the UK Science Policy, through the Office of Science and Technology (OST), and for promoting the development and use of technology by industry. The most recent government paper on science policy "Investing in Innovation: a strategy for science, engineering and technology" (July 2002)<sup>50</sup> highlights that a key objective of the government's science strategy is to increase the competitiveness of industry, especially manufacturing. In furtherance of this aim, the DTI's International Technology Service "raises awareness of, and facilitates access to, overseas technology"<sup>51</sup>. At the same time, an important aim of the promotion of the UK science base overseas by Invest UK, part of British Trade International, is to attract inward investment. There is no explicit government-wide objective to utilise the UK science base to help achieve beneficial international development outcomes.

#### *The Research Councils*

19. The mandate of the Research Councils is to conduct fundamental research relevant to the UK. There is an international dimension to their operations, but this is primarily targeted at the European Union and at information exchange with advanced institutions. The Research Councils sponsor the UK Research Office (UKRO) which "exists to promote effective UK participation in European Union funded research, higher education and training, and related activities". However, the potential effects of globalisation and climate change means that the value of research conducted in developing countries is becoming increasingly relevant to the UK. For example, the threat to the UK posed by exotic infectious diseases of livestock was highlighted in a recent report by the Royal Society<sup>52</sup>. This issue is now being addressed in a joint programme funded by the Biotechnology and Biological Sciences Research Council (BBSRC) and the Department for Environment, Food and Rural Affairs (DEFRA). Similar concerns have been identified regarding the risks of invasive pests and pathogens<sup>53</sup>. The expertise gained through research targeted primarily at developing country problems could be utilised very effectively to address UK problems.

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<sup>49</sup> NAO (2003) Getting the Evidence: Using Research in Policy Making (HC 586-1 Session 2002–03).

<sup>50</sup> [http://www.hm-treasury.gov.uk/media//CD6C4/science\\_strat\\_sum02.pdf](http://www.hm-treasury.gov.uk/media//CD6C4/science_strat_sum02.pdf)  
[http://www.hm-treasury.gov.uk/media//3ECF1/science\\_strat02\\_ch1to4.pdf](http://www.hm-treasury.gov.uk/media//3ECF1/science_strat02_ch1to4.pdf)  
[http://www.hm-treasury.gov.uk/media//59A17/science\\_strat02\\_ch5onwards.pdf](http://www.hm-treasury.gov.uk/media//59A17/science_strat02_ch5onwards.pdf)

<sup>51</sup> World Bank (2003) Reaching the Rural Poor: A renewed strategy for rural development. ISBN 0-8213-5459-0.

<sup>52</sup> The Royal Society (2002) Infectious disease in livestock. ISBN 0 85403 580 X.

20. The BBSRC has an annual research budget of £250 million. As well as running a competitive grants programme, it sponsors eight strategic research centres, six structural biology centres, six institutes jointly with DEFRA and six Scottish Agriculture and Biology Research Institutes. There is no joint strategy development between DFID and the BBSRC or any of the other UK research councils, although some institutions supported by the BBSRC and Natural Environment Research Council (NERC) are represented on advisory committees of DFID's flagship research programme for agriculture and rural development (see paras 31–35). Whilst institutes sponsored by the research councils, such as IACR Rothamsted and the John Innes Institute participate in projects won competitively through DFID's funded research programmes, they also conduct basic research that may have the potential for significant beneficial impact in developing countries.

#### *Higher Education Funding Councils*

21. The Department of Education and Skills through the Higher Education Funding Councils provides support for research in UK universities. This consists of two main elements—the Research Assessment Exercise (RAE) and the Science Research Infrastructure Fund (SRIF), although allocations under the latter are related to performance in the former. Again there has been little or no participation by DFID in determining the allocation of these funds. In the most recent RAE in 2001 a Development Studies sub-group of the Geography unit of assessment was established and DFID was represented on the panel. However, in other units such as Agriculture the overseas development aspects were not represented and the outcomes would suggest development-related research was not highly regarded by the panels.

22. It is of great concern that much of the research that has high developmental impact is not highly rated by the Funding Councils through the Research Assessment Exercise (2001)<sup>54</sup>. This has resulted in a significant decline in the availability of funding for agricultural research for development. Meanwhile, the Parliamentary International Development Committee has drawn attention to the fact that this type of research is crucial for poverty reduction<sup>55</sup>.

#### *Cross-departmental co-ordination on the use of science and technology for development*

23. Whilst no formal mechanism exists for the coordination of the programmes of the various government agencies and funding bodies with regard to the use of science and technology for development, DFID liaises with other government departments through the Inter-Departmental Working Group (IDWG). The IDWG is chaired by the Secretary of State for International Development and responsibility for the IDWG rests within DFID's Performance and Effectiveness Department Policy Co-ordination Unit. Opportunities to strengthen this group may be desirable.

24. DEFRA has an annual budget of £300 million for research. It sponsors five science agencies as well as running a competitive grants programme. DEFRA is represented on the IDWG, but linkages between DFID and DEFRA are not well developed and there is scope for greater co-ordination of their respective research strategies. Sustainable development, both domestically and internationally, is now a recognised policy of the UK government and DEFRA has responsibility for “leading across government” on this issue. DEFRA co-ordinated the UK's participation in the World Summit on Sustainable Development in 2002 and has recently established a Sustainable Development Research Network<sup>56</sup>. However, this Network does not currently include organisations primarily engaged in international development research and the focus appears to be on the UK and Europe. DEFRA does fund research in certain specific areas that contribute to international development targets, notably the Darwin Initiative that addresses biodiversity issues<sup>57</sup>. We suggest that DFID engages actively with DEFRA on sustainable development through a formal mechanism such as a concordat or a merged budget.

25. DFID has concordats with both the Medical Research Council (MRC) and NERC, although a recent report suggests that it is not planning to renew the agreement with NERC<sup>58</sup>. This report, and that of the Surr et al.<sup>59</sup> study on DFID's research strategy, recommended that DFID renew these existing agreements and also establish concordats with other Research Councils such as the Economic and Social Research Council (ESRC). This type of arrangement is also consistent with recommendations made by the committee

<sup>53</sup> Protecting England and Wales from plant pests and diseases (2003). [http://www.nao.gov.uk/publications/nao\\_reports/02-03/02031186.pdf](http://www.nao.gov.uk/publications/nao_reports/02-03/02031186.pdf)

<sup>54</sup> See <http://www.hero.ac.uk/rae/>

<sup>55</sup> International Development Committee (2003) Department for International Development: Departmental Report 2003. Eighth Report of session 2002–03. 42pp.

<sup>56</sup> See <http://www.sd-research.org.uk/>

<sup>57</sup> See <http://www.darwin.gov.uk/>

<sup>58</sup> S Anton and J Grant (2003) Review of the Department for International Development's role in the national research effort.

<sup>59</sup> M Surr, A Barnett, A Duncan, M Speight, D Bradley, A Rew and J Toye (2002) Research for Poverty Reduction: DFID Research Policy Paper.



that conducted a cross-cutting review of UK science and research in 2002<sup>60</sup>. This committee recommended the wider use of merged budgets with shared steering arrangements, examples of which exist for research into health issues such as transmissible spongiform encephalopathies.

26. The cross-cutting review also identified that a lack of in-house scientific capacity, especially at the highest level, made it difficult for government departments to effectively integrate science and research into their policies. The review recommended that departments should appoint Chief Scientific Advisers to fulfil this role. In the case of DFID, a Chief Scientific Adviser might also promote the department's research interests in the national and international arenas, as envisaged in a recommendation of the Surr Report. DFID formerly had a Chief Natural Resources Adviser who, in broad terms, carried such a remit. However, this post no longer exists. DFID would benefit from the appointment of a Chief Scientific Adviser and the establishment of an external advisory committee on science and technology for development. This would provide the vision, leadership and direction required to gain recognition for DFID-funded research within the wider UK science and technology programme. It would add value to both the DFID-funded work and that of other UK agencies, help to ensure that UK research has a significant influence on the international development agenda and guide the significant EC funds for science and technology implemented through the 6th Framework Programme of the EC<sup>61</sup>, in particular, ensuring that they give adequate emphasis to developing country needs. Such high level leadership would also guide a new and more robust engagement between DEFRA and DFID underpinned by a concordat and possibly a merged budget on key areas of work of mutual interest.

#### *Implications and key points*

27. No formal mechanism exists within the UK for the coordination of the programmes of the various government agencies and funding bodies with regard to the use of S&T for development.

28. We recommend that DFID appoint a Chief Scientific Advisor and establish an external advisory committee on S&T for development, mandated to provide vision, leadership and direction within both the UK and international arenas.

29. Different structures and mechanisms are in place through the Research Council and Higher Education Funding Councils to support S&T and these may act to the disadvantage of the UK capacity to contribute to S&T for international development.

30. There are two-way benefits to be achieved through wider UK participation in S&T of developing country interest and concern.

#### *C.2 The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes (in the context of agriculture and food, natural resources and rural development)*

##### *DFID and the Renewable Natural Resources Research Strategy (RNRRS)*

31. There are a number of centrally driven and managed research budget lines within DFID designed to support the generation of S&T for international development and to contribute to informing DFID's own policy and programmes. Additionally, DFID may commission ad hoc studies, often economic and social in nature, to contribute to its policy formulation both through central policy groups and through DFID's regional programmes.

32. Of particular interest to this debate is DFID's Renewable Natural Resources Research Strategy (RNRRS). This is a ten year effort (1995–2005) valued at a total of almost £200 million and managed through DFID's central department. It aims to generate scientific and technological outputs in support of agriculture, natural resources management and related sciences for poverty reduction in developing countries. This strategy is implemented through ten programmes the management of which is sub-contracted through six UK-based institutions who themselves sub-contract sub-projects and programs to both UK and non-UK centres usually through a competitive process.

33. The Programme Managers with their associated Programme Advisory Committees (PACs) define the three-year work plans within the broad 10-year strategy. Whilst the original themes of the strategy were defined by DFID Central Policy and Regional groups, there exist limited structured and on-going supply—demand relationships which inform the final content of the research programme. DFID acquires the outputs through receipt of published papers and reports, regular reports from Programme Managers, and through seminars presented to interested DFID teams. At the country level, DFID advisers agree proposed research activities where there are local counterparts and/or interactions with national organisations and may have direct contact with the individual research teams. A DFID representative sits on the PACs. There are a limited number of examples of the DFID bilateral programme co-sponsoring RNRRS initiated research and/or paving the way for strategic uptake at country or regional levels.

<sup>60</sup> Cross-cutting review of science and research (2002) <http://www.ost.gov.uk/policy/advice/crosscut.htm>

<sup>61</sup> See [http://www.europa.eu.int/comm/research/fp6/index\\_en.html](http://www.europa.eu.int/comm/research/fp6/index_en.html)

34. There is no structured, transparent and coherent mechanism for scientific advice to be offered to DFID drawn from the work of the RNRRS beyond the reporting of research outputs. Programme Managers may be invited to comment on a particular technical issue and/or UK based institutions may be contracted to prepare thematic position papers but this happens infrequently. Beyond the RNRRS and in the field of agriculture, natural resources management and rural development there is no platform for equitable dialogue between the wider UK science base and the DFID which can inform development policy and programming.

35. Over recent years, DFID seems to be moving increasingly towards policy research and away from support for the development and promotion of new technologies. The report of the House of Commons International Development Committee on the DFID 2002–03 Departmental Report urges DFID to support research to increase the productivity and incomes of smallholder farmers, rather than simply to help create an enabling environment through policy research. As identified by the IDC, this type of research is crucial for poverty reduction.

#### *The institutional architecture for S&T in the UK and its relationship with DFID*

36. The UK S&T for development funded through public sector sources is undertaken in general by, and/or with leadership from, dedicated groups devoted to particular aspects of developing country S&T. These include dedicated profit and not-for-profit institutions and departments or groups within departments directly affiliated and constituted within Universities. With the exception of a number of the specialist social science and economic policy groups, the majority of the life sciences groups are small in size of staff numbers (ie an estimated up to 15) and sectoral (livestock, fisheries, animal health, arid zone development, etc) in nature. Of these latter institutions, a significant proportion of their funding is derived through DFID sources. In addition, some of the BBRSC and NREC sponsored institutions provide inputs in partnership with others and/or are contacted directly by Programme Managers to contribute specialist inputs to the RNRRS.

37. Of the University Departments, most combine some form of teaching with research work and some include a policy advisory capacity. The Natural Resources Institute (NRI) is the sole UK centre with a dedicated cross-cutting team of international development specialists addressing life sciences, social sciences and economic and trade policy dedicated to international development. The Institute combines the skills and capacity to undertake research, research adaptation, training and education, and advisory functions.

#### *The Natural Resources Institute*

38. The Natural Resources Institute was an Executive Agency of the DFID and in the context of this inquiry the organizational changes that have taken place over the past ten years and their impact on the UK's contribution to international development warrants consideration. The most fundamental change in the institutional structure took place between the mid 1980s and mid 1990s, culminating in the privatization of NRI in 1996. Until 1996, the NRI had been an integral part of the UK public administration responsible for development and as such staff, as UK civil servants, were directly involved in planning and policy dialogue for overseas development and the S&T that underpinned demand-led short and long term activities. Funding was secure and long-term human development planning was feasible and in place. There was an exchange of staff between the technical and programme divisions of the public administration. Many technical staff moved into senior and influential positions within the wider development administration as well as within international agencies.

39. Privatization broke the structural and professional linkages between the NRI and the DFID and moved the NRI into a position of service provider to DFID at all levels of activity whether S&T, advisory or long term technical cooperation. Services are now provided on a contractual and mainly competitive basis.

40. The opening to full competition for DFID research funding, a significant decline in the DFID's bilateral programme in agriculture and natural resources management, and shifts in investment by DFID from project investment with technical cooperation/ advisory components to programmatic assistance, has seen a major decline in the use of the dedicated skills of the NRI. NRI has seen a major reduction in DFID funding for all services, ie 1995 £18.04 million, of which research was £9.05 million compared with 2003 £5.42 million, of which research was £3.86 million. Demands for all services from non-DFID sources have however risen (from 1995 £3.15 million; to 2003 £5.02 million) albeit at a slower pace and at a level which has not been able to sustain the skills base and resource at earlier levels. Prior to privatization, ie 1995, the NRI staff numbered 480 including permanent staff and short term appointees. Of this total, 284 were in middle-senior grades including some 30 staff in dedicated long term advisory posts working as technical cooperation officers in developing countries. By 2003, the total staff number has reduced to 105 of which 82 are in equivalent middle-senior technical and professional grades.

41. Of the staff who moved out from NRI, some are now based in DFID, while others are in international development agencies and/or work as freelance contractors. Few however have been able to secure posts in the generation of S&T and a majority have been forced out of international development entirely. Key

resources lost from the NRI include pesticide chemists, entomologists including locust specialists, plant pathologists, agricultural economists, food scientists, mycotoxicologists, agronomists, environmental monitoring and remote sensing specialists.

42. Whilst over the 10 year period funding through DFID for S&T relevant to agriculture and undertaken by a range of UK and non UK institutions through the RNRRS has remained stable, the sale of NRI by DFID with the associated staffing and capital assets cost commitments, suggest that in overall terms there has been a marked decline in the long term commitment by DFID to S&T for agriculture and related sciences. The loss in UK human capital in particular within NRI including lost opportunity costs, loss of institutional memory and reduced national (ie within the UK development programme and within the UK more widely) and international influence has not been fully costed and the long-term implications have not been assessed.

#### *Competitive nature of commissioning S&T and sustainability*

43. Whilst there are gains in the opening-up of the competitive commissioning process for DFID funded S&T through the RNRRS in particular the exploitation of untapped potential, such gains may be outweighed by some of the weaknesses noted in the following section.

44. The hands-off relationship between DFID and the UK scientific community defended in the interests of fair and open competition has removed the opportunity for the UK S&T community to guide and inform government of cutting-edge options and opportunities thereby reducing the capacity of the UK science base to influence future directions and priorities as well as impacting on uptake pathways and mainstreaming of outputs. The competitive system, by stressing competition between research providers, can further seriously impair the formation of long-term alliances between different providers reducing opportunities to build on different corporate advantages.

45. Despite the long term nature of the RNRRS, most research work is commissioned on a short term basis (normally three years or less) and with relatively small size of single contracts (the larger in the order of £200,000/annum and many significantly smaller in size). This has impacted on the nature and quality of work, the capacity of institutions to invest in both people and capital assets for S&T generation and has contributed to the steady reduction in the numbers of scientists in institutions across the UK and the erosion of intellectual capital.

46. New providers to DFID, drawn from the UK or OECD research arena, often lack in-depth experience in developing country systems and an understanding of models of successful S&T transfer. This weakness can limit new providers having significant developmental impact in particular where the uptake pathway is not guided by a structured and supportive system within DFID itself.

#### *Core funding and untying of aid—implications to UKS&T capacity*

47. DFID has adopted the principle of untying aid<sup>62</sup> as fundamental to its involvement with S&T. While the untied competitive approach may have considerable merit in delivering discrete clearly identified physical development interventions eg roads, dams, etc., it can be seen as having serious disadvantages in the production of effective and sustainable knowledge based interventions. It is noted that other countries have not all followed this principle (see also para 49).

48. The removal of any element of core funding to institutions and groups dedicated to international development has had serious negative effects on sustaining specialist research capacity appropriate for developing country research. Additionally, DFID uses UK research organizations often for free and with no safeguards on intellectual property issues to contribute to its research planning (note the recent DFID call for proposals for the 2005 research planning process) and yet DFID's published view is that it has "no responsibility to maintain UK research capability per se" (Executive Summary of Surr Report, 14.11). The UK research institutions are effectively caught in the trap of feeling obliged to assist DFID, with no guarantee of reciprocity.

49. There is a serious threat that UK research expertise will be sidelined in favour of other European institutions core-funded by their governments, and heavily-endowed US universities. There are at present few signs that UK institutions are able to compete on a level playing field for development-linked research funds from those countries—in the case of USAID research funds they are virtually unable to compete at all. Furthermore, UK institutions have difficulty finding co-funding for research opportunities from other international donors. This places them at a disadvantage in access funds from for example the EU through the Sixth Framework Programme.

<sup>62</sup> The use of "untying aid" may be inappropriate in the context of research. The ethical and political imperative to untie aid applies to sectors (such as construction) where the most important actors are profit-making companies for whom development is not a core part of their mission. In the research sector the majority of actors are not-for-profit, and many of the most important actors are organisations dedicated to development and poverty eradication in the less-developed countries. These research actors risk being collateral damage of a policy directed at major engineering and construction companies.

50. There is a further lack of consistency across the UK departments/funding sources in their approach to core-funding to resource centres for the work on international development eg ESRC provides core funding to two Groups on Wellbeing in Developing Countries (University of Bath and the Centre for the Study of African Economies) within the overall goal of ESRC to develop a socio-economic resource base in the UK. This differs from the current DFID approach for which no core funding or longer term commitment is offered.

51. It may be argued that a model nearer to that adopted by the BBSRC where selected institutes receive long-term funding to support specialist staff and research programmes to supplement competitive grants for particular projects, is more effective in delivering effective S&T interventions. Such grants are of course subject to frequent and in-depth review to ensure goals, standards and programmes meet funder's requirements and give value for money.

52. A related issue is the shift in funding from UK to southern research institutions. While anyone serious about research for development must recognise that this is both right and inevitable, there are concerns at the speed and manner in which this has been implemented in some DFID programmes, which has frequently entailed serious hidden costs to UK research institutions in doing the majority of work in preparing and effectively co-ordinating research projects for which they receive little financial reward or intellectual recognition.

#### *DFID and the CG systems—levels of funds and the opportunity cost*

53. DFID continues to be a major contributor to and influential player within the Consultative Group for International Agricultural Research (CGIAR). Whilst recognizing the wealth of capacity in the CGIAR in particular its strong emphasis on germplasm research and the CGIAR's contribution to the development of high yielding maize, rice and wheat, it has less capacity in natural resources and water management, social sciences, economics and policy, and in key commodities of major importance to the international trade including market access for developing countries.

54. The principal impact of the CGIAR, ie "the Green Revolution", has been mainly seen in Asia. It has had less impact in sub-Saharan Africa and on the cropping systems that feed the poorest in Africa. Despite continued attempts to reform the CGIAR with mixed success, DFID continues to maintain its support and may even consider the possibility of returning to core funding. It is possible that at least some of the same developmental outputs could be derived more cheaply and efficiently from the "highly reformed" UK institutions at its disposal working with developing country partners. What is often under-recognized in terms of UK's S&T contribution to development, has been the scientific contribution made by UK based institutions to the CGIAR through the innovative partnership funding of DFID such as the hold-back program (now no longer in operation) which fostered such linkages between UK, CGIAR centres and national systems. A similar mechanism is at the heart of the new "Challenge Programme" now managed through the CGIAR which DFID is supporting.

#### *Factors motivating scientists to work in development*

55. Scientists entering careers in development often do so for a range of personal as well as professional motives. There is a strong commitment to the goals of international development amongst the professionals in this field. It is recognized that the returns to effort in terms of publication and recognition are different in applied development science which often include directly and indirectly capacity building of southern partners. Whilst rewarding, this is often at time cost to research and thus volume of outputs. If developed and developing country focussed S&T is to access the brightest and the best talents, there needs to be a career and incentive structure to allow scientists, both natural and social, some degree of security combined with an appropriate and valued reward system. The current structure in the UK does not offer this and there is a resulting decline in the number of young scientists able to get into and willing to remain in a career in S&T for development.

#### *The new DFID strategy 2005 onwards*

56. Within the new DFID Policy Division, the Central Research Team (CRT) has responsibility for developing a new research strategy which for the first time in DFID will be a single strategy covering all sectors. The CRT appear to be under extreme time pressure to define the first iteration of the new DFID strategy. This seems to have prevented DFID from undertaking an in-depth review and impact assessment of earlier investment including learning lessons from the processes as well as consulting with development partners in the south as to their felt future needs. The level of consultation with the UK S&T base on this new strategy has been minimal.

57. Perhaps of particular concern in the field of agricultural research is the lack of a review of the RNRSS which despite some criticisms is arguably one of the few international efforts to implement a long-term agricultural and natural resources research strategy. As a major UK innovation this deserves a proper appraisal. Opportunities to exploit S&T generated for wider development gain could usefully be explored further.

*Implications and key points*

58. The processes of contracting and subsequent sub-contracting of research dissipate both the strategic planning for and the acquisition of knowledge and advice by DFID and dilutes the value of the investment. The hands-off and disassociated relationship between DFID and the UK science base in general and specifically in the context of agriculture and allied sciences, creates a poor institutional environment for effective acquisition and use of scientific outputs and advice. It is recommended that the customer-contractor relationship is revisited and that a more equitable partnership for dialogue, strategic planning and provision of advice is put in place.

59. Centres of excellence with their necessary physical and human infrastructure cannot be maintained in an unstable funding environment where no mechanism to even out funding is in place.

60. The rapid and on-going erosion of UK centres of excellence indicate that should the UK wish to acquire advice and knowledge (for purposes of public policy, maintenance of capacity within government, strategic understanding within the United Kingdom and advice and support to client countries) over the next 10–20 years, this may have to be sourced from non UK sources. It is recommended that the government reconsider its relationship with the UK science base for development and if it does require a standing capacity then a new relationship will need to be put in place to support it.

61. Strategically, DFID could usefully put in place a structured learning process that can inform future investment. Such a process would aim to understand what has worked well from the past investment in S&T on agriculture, food, natural resources and rural development managed through central UK funds, as well as direct funding to international organizations and through the development programme.

*C.3 The extent to which an investment in research and the promotion of innovation play a part in DFID's country level development programmes**The alignment of S&T with developing country needs*

62. The poorest countries who face hunger and health problems demand S&T interventions as well as policy advice. Crucially in sub-Saharan Africa access to improved S&T for food production, disease control, environmental sustainability are perceived as central to reducing poverty, hunger and ill health. Countries in sub-Saharan Africa see their challenges as rooted as much in inequitable access to S&T as poor policy and governance. (Sub-Saharan Africa visit by UK ministers 2003). Policy advice alone will not overcome their developmental problems.

63. The UK has a high profile in key science and technologies that can impact on poverty, hunger and health. However not all of the output is appropriate for uptake by developing countries in its existing form. Technologies often need adaptation if they are to be successfully integrated into poor countries' contexts where constraints including social, political, infrastructural, environmental, economic are different from the UK or other OECD countries. A technology that can appear beneficial from an OECD country perspective can be inappropriate in a developing country or can have adverse developmental or social consequences when applied in many developing countries. Successful adoption of S&T usually requires strong equitable partnership between the developing country scientists and OECD scientists.

64. In many other countries (US, France, Holland, Germany) governments and their development agencies have recognised mechanisms of funding to ensure specialist research dedicated to international development is available and retained as part of the national S&T asset portfolio. This is seen as both adding to the effectiveness of aid policy and conferring significant benefits on the competitiveness of national S&T industry.

65. There remains a crucial need for the UK to maintain its capacity for adaptation and mediation of S&T generated. Such skills are held within institutions such as NRI. However, the fragmentation created by open competition for the DFID funds has weakened the capacity of the UK science base to sustain the capacity for supporting the adaptation of the technology.

*S&T and development continuum within the development programme*

66. The RNRRS programmes are each guided by a Programme Advisory Panel (PAC), with limited representation from DFID's country programmes. Although teams were requested to seek uptake pathways, the level of investment by DFID to foster this at country and regional levels has been minimal and has been left to the good will or motivation of individuals in country offices. The initiative is left with the many project teams and/or the Programme Managers to seek uptake pathways. This has resulted in a disbursement of effort, overlap at country level and thus reduced the potential for impact.

67. The coordination across the ten PACs has not been institutionalized and has thus been ad hoc in nature mainly at the initiative of the individual PAC chairpersons themselves. This further reduces the opportunity for cross-sectoral learning and value-adding to the programme at the level of both S&T generation and uptake at country levels.

68. The RNRSS's focus on small (<£200K) and often three year projects (albeit set within a longer term programme and some of them recurrent in nature), is also a major weakness as it is clearly impossible to tackle major problems effecting millions of people in many countries with a fragmented structure. There is an element of serendipity as to whether a research effort can secure say a 6–8 year research funding with all the associated institutional and organizational risks.

69. Whilst there are examples of where there has been “good practice” linking DFID funded research to a managed uptake pathway sponsored by DFID and funded through the country bilateral programme, there are many more examples of where the S&T generated through the RNRSS has found favour and interest with other development agencies and or directly with developing country governments and civil society (Box 1). In general, attaining sustainable development impacts requires a long-term commitment, the involvement of multiple partners, and a commitment to development funding of the technology transfer within the aid programme at country level.

*Box 1 DFID funded research working in partnership with international agencies, civil society and national governments*

*Cassava: securing a major food crop in Africa*

The partnership: The CGIAR, the DFID Crop Protection Programme, the Natural Resources Institute, the Gatsby Foundation and USAID as well as the Government of Uganda.

The challenge: In the late 1990's over 25 million people in East Africa were directly affected by the damage caused by cassava mosaic virus and the associated white fly causing millions to abandon their crops.

The outcome: Through a programme linking research to operational interventions, cassava mosaic resistant varieties were developed and distributed. An evaluation indicated that the gross monetary benefit of the introduction was in the order of £60 million/annum at a cost to DFID of some £2.5million. Food security for many million households was enabled.

*Insecticide resistance in cotton in India*

The partnership: DFID Crop Protection Programme, the Natural Resources Institute, National Research System, India, Common Fund for Commodities. £2 million from DFID (late 1980's—to date).

The challenge: An estimated £200 million/annum damage is caused to the cotton crop in India by the cotton bollworm. Large quantities of insecticides are applied by farmers trying to control the pest causing significant environmental and human health problems. Furthermore, this strategy now has limited efficacy due to the development of resistance of the bollworm to insecticides.

The outcome: Over 3,000 farmers benefited in four states in India by 1999. Subsequently the Indian government fully funded the initiative (Rs25 million for the current phase) which incorporates the 10 major cotton growing states with an estimated 30,000 farmers. The prospects for national level insecticide use reductions and profitability increases are excellent. The Common Fund for Commodities is now spending some £3million on deepening the background science for China, Pakistan and India (2000–04). The research capacity at several of the cooperating laboratories in India has now reached a level similar to that of UK and US laboratories. Much of this can be attributed to the successful linkages between projects and a continued vision of building capacity in these targeted areas.

*Reducing the threat from the Larger Grain Borer in sub-Saharan Africa*

The partnership: DFID has funded NRI through their RNRSS research programme and bi-lateral programmes, particularly in Ghana (£1.4 million) and Tanzania (c. £2 million). Other funding partners included GTZ (Benin and Togo), EU (Uganda), FAO (Tanzania), and SADC (Zambia). The public and private sectors in all cooperating countries were key partners.

The challenge: To reduce post-harvest losses on farms caused by Larger Grain Borer (LGB) infestation and to restrict the rate of spread of the pest in Africa.

The outcome: Within three years of the first outbreak in Africa, field trials on potential control measures made on-farm control a reality. NRI identified a novel insecticide mixture which, when used in conjunction with changes to the traditional maize storage system, not only controlled LGB but also the indigenous storage pests. The method has been successfully introduced into several African countries through multilateral and bilateral donor-funded programmes. The impact of the research in Tanzania alone has resulted in a reduction in maize losses equivalent to £21.5 million, as assessed by external project evaluators.

*Implications and key issues*

70. The 10-year RNRSS may not realise its full benefits and impact without an adequate and coordinated uptake pathway for research outputs and an integrated knowledge system aligned to and supported by the wider development programme of DFID at country level.

71. The structure and management of the RNRSS could in addition have had unforeseen impacts on the capacity of the UK S&T base to service the research-to-development outcome continuum.

72. It is necessary to move to larger long-term programmes involving consortia of research institutes with engagement by developing country institutions as equal partners combined with a clear policy and strategy within DFID to support S&T within the development programme if a major impact is to be achieved.

*C.4 The progress of UK effort to build scientific, technical and engineering capacity in developing countries to help them overcome trade restrictions and the coordination of these efforts with NGOs, charities and international programmes*

73. Trade restrictions, in particular non-tariff barriers, continue to pose major constraints on developing country exporters to global markets. Increasingly with globalization of trade and changes in national wholesale and retail structures, technical, sanitary and phytosanitary requirements are becoming the norm also within national systems. Meeting these requirements whether at national or global market levels, places heavy knowledge and skills demands on the national governments to provide guidance, an enabling framework, analytical capacity and regulatory structures as well as on the private sector including the trade and producer groups.

74. DFID, through the bilateral programme, has supported a limited number of country-level projects to help to overcome these barriers (Box 2). However, the greatest call for services of, for example, NRI has come through the WHO, FAO and EU where over the past three years capacity-building in specialist technical areas (eg harmonization of food legislation, support to Food Control and Inspection Systems, analytical capacity building for specialist laboratories, research planning for food safety, formulation of national food safety policy, trade, industry consumer relations) has been undertaken in Dubai, Zimbabwe, Zambia, Kenya, Tanzania, Malawi, Uganda, Ethiopia and Poland. NRI has supported WHO in the incorporation of Hazard Analysis Critical Control Points (HACCP) into national food control programmes in Tunisia and Thailand.

*Box 2 Examples of DFID country support to trade access and meeting non-tariff barriers in the food sector*

*Strengthening the small and medium enterprise (SME) agro-processing sector—Central America and the Caribbean*

Guidelines for Food Safety Management Systems (FSMSs) based on general requirements for hygiene and principles for Hazard Analysis Critical Control Points (HACCP) are defined internationally by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). NRI, funded through DFID's bilateral programme (1994–1999), worked with a centre of excellence in Costa Rica to build up the capacity of selected regional SMEs to establish and operationalise necessary FSMSs. Work included systems analysis, cost assessments, training and capacity building including work periods with UK industry. These SMEs are now able to meet international requirements securing local and global market access.

*Training of trainers in food safety including HACCP—Food and Drug Board Ghana (FDBG)*

Through a programme of analysis of food industry requirements, in particular for SMEs, capacity building of country level trainers in FDBG and exchange visits to UK industry, the FDBG has been recommended to become a training centre of HACCP courses by the Royal Institute of Health—an internationally recognized body for the promoting of training of professional people in Ghana and West Africa.

75. In the past DFID has provided, through the use of NRI staff, representational inputs into international standards setting organizations with responsibility for commodities and/or issues of developing country concern (including British Standards Institute, International Standards Organization and CODEX committees, intergovernmental commodity groups). Funding for this has diminished and as far as we are aware, DFID is no longer represented on many of these committees and working groups, thus reducing the UK's influencing role in the interests of developing countries and in informing the wider UK and international development debate and policy.

76. Beyond the services of NRI, the UK holds extensive and highly relevant capacity in the food industry both in the private sector and within specialist institutions, which could be mobilised to play a greater and more strategic role in supporting developing countries to meet non-tariff barriers as well as protecting the interests of the OECD consumers and producers. It should be noted that whilst much of this work may not require basic research, institutions offering capacity building capability must maintain state of the art knowledge and skills. This is often best secured through commercial practice as well as ongoing research and analytical work.

77. As well as meeting the specific non-tariff barriers, there is an increasing demand on UK public and private sector skills and expertise to assist developing countries' public and private sectors to build up their export capacity (Box 3 illustrates a recent DFID supported initiative). The UK has extensive skills in this field, building on its robust private sector but also on the deep and long standing expertise held within academic and policy institutions. Unlike, for example the USAID, the UK is not taking strategic advantage of this capacity.

*Box 3 DFID funded support to the export sector*

*Strengthening the horticultural export sector in Ethiopia*

The partnership: DFID funded the NRI to work in partnership with the UK supermarket sector and Ethiopia based consultants in 2002

The challenge: To review factors limiting the expansion of the horticultural export sector from a market opportunity, institutional and technical perspective and make recommendations for support to the local and foreign private sector investment. The review undertook a wide range of analysis including market assessment, technical and organizational appraisal, and assets analyses including land, transport and credit.

The outcome: The majority of the recommendations made have been adopted by the Government of Ethiopia and there has been an immediate and encouraging private sector response including Direct Foreign Investment during 2003.

*Implications and key issues*

78. The UK has strong public and private sector competence and capacity to support developing countries in taking advantage of trade opportunities and in building up national capacity. New models to foster greater use of this capacity bringing together the public and private sector could be developed. Learning from the experiences of others, eg USAID, could also offer in-sight.

*C.5 The ways in which the role of the private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for developing countries can be enhanced*

79. Investment in research by the UK and wider OECD based private sector is many times higher than that of the public sector, and much of the private sector investment has potential relevance to developing countries.

80. In general, the private sector sees limited commercial prospects in S&T related to food and agriculture in poorer countries with the result that there is weak private sector interest in the adaptation of the S&T generated for developed county markets for developing countries' needs or commodities. The means to create incentives for the private sector to contribute may need to be developed and lessons might usefully be learnt from the human health sector (HIV/AIDS, malaria, etc).

81. DFID has initiatives (eg Business Linkage Challenge Fund) to encourage the UK private sector to develop sustainable business partnerships with developing country enterprises. However the extent to which these offer success stories requires review. The private sector see such processes as having high transaction costs, and often find unacceptable the decision processes and timelines applied. New models may need to be developed if the public sector is to tap effectively into this significant private S&T capacity.

82. One model that might be built on is the successful Knowledge Transfer Partnership (KTP) programme run by the Department for Trade and Industry (DTI) which offers direct assistance to individual small and medium-sized enterprises. KTP provides a grant to establish a direct linkage between a University/institute and a single business. This is achieved by placement of a University/institute employee (with operational funds) in the company for a period of two to three years to apply their research knowledge to resolve technology and logistical problems. The overall aim being to help the business make a significant step change in an area that has been identified as a high priority (for example, NRI has received funding to provide technical and logistical support to a national food importer and supplier of tropical horticultural produce to major UK multiples). This approach centres on improving business performance (rather than technology development per se) and resolves a number of issues including IPR and competitiveness associated with those programmes that involve link partnerships between developed and developing county businesses. It fosters indigenous commercial development.

83. It should however be noted that a strong public sector capacity within developing countries as well as within the international public research system, is essential to undertake research that the private sector cannot and will not generate. Such developing country capacity is needed to also inform policy, to foster the enabling environment for growth, to adapt public and private sector generated technology, and to guide and participate in global research partnerships (see also para 12 on levels of investment).



84. As one of the consequences of the 20-year decline in donor assistance to agriculture<sup>63</sup> has also come a disengagement from support to capacity building of national and regional research systems and responsible public authorities including regulatory bodies within developing countries. In many countries, particularly in Africa, such institutions are in crisis. This position must be reversed if developing countries are to become equal partners in trade and achieve poverty reduction outcomes.

*Implications and key issues*

85. A strong public sector active in S&T is essential both within developing countries and within the international arena to ensure pro-poor outcomes of technology generation and adoption as well as to enable effective and equitable partnership with the private sector.

86. It is recommended that the UK strengthen its contribution to concerted and sustained international effort to secure sustainable national and regional public research systems within developing countries.

87. Opportunities exist to develop further models of public-private partnership in order to mobilize the significant potential held within the private sector for commercial and as well as public-good outcomes in the interests of poverty reduction.

*C.6. The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries*

88. The UK has a long and successful tradition of providing S&T training to developing countries. Such training encompasses study for undergraduate degrees and diplomas, postgraduate qualifications in taught and research mode (for example MSc and PhD studies) and continuing professional development at all levels. Although some of this training is provided in-country (by visiting staff), a significant portion is undertaken in the UK. The greatest impediment to providing training is available funding, either to enable students from developing countries to come to the UK or for sending UK-based trainers to work with developing country academic institutions.

89. DFID contributes to aspects of training by: sponsorship of students attending UK universities (for example through the DFID Shared Scholarship Scheme which is taken up by around 55 universities offering a total of 160 places); funding through the bilateral programme of bespoke short courses (with a highly focused specialist element); and through targeted human developments aid projects (eg vocational training in horticulture/agri-business in Colombia in the 1990s). Historically, many of DFID's development aid projects also provided a component of in-country training (primarily through technology transfer), although such project components as well as focussed training and capacity building projects are in decline. Securing a sustained and responsive capacity within developing countries both within the public and private sectors adequate to meet the evolving development challenges requires a significantly enhanced effort.

90. Drawing on NRI's own experience, NRI has provided formal post-graduate training since 1972 when it initiated a training course on Storage of Durable Agricultural Products in the Tropics (between 1972–93 some 360 students participated from developing countries). In 1993 this course was replaced by a Post-graduate Diploma/MSc course in Grain Storage Management, validated by the University of Greenwich. Since then other post-graduate courses have been run in Post-harvest Horticulture, Natural Resources and, latterly, Food Safety and Quality Management. Nearly 200 students from Sub-Saharan Africa, south and East Asia, the Middle East and Central and South America have been awarded MSc or Post-graduate diplomas since 1994. Sponsorship of the Diploma and MSc students has come from a very broad mix of sources including the DFID Shared Scholarship Schemes, British Council, Asian Development Bank, FAO, and the German Aid Agency GTZ.

91. Most of the students attending courses at NRI, leading to a named award, have been professional staff from the public sector in developing countries, eg ministries of agriculture, national research and extension institutions. Many return to their original departments, and often into positions where they are able to contribute to national and regional policy development. Examples of those who have studied at NRI include: Acting Director General, National Agricultural Research Organisation, Uganda; Assistant Director, Pakistan Science Commission; Principal Environmental Management Officer, National Environmental Management Council, Tanzania; Director of Kisii Regional Research Centre of the Kenya Agricultural Research Institute (KARI), Kenya; Marketing manager, Cocoa Marketing Board, Ghana; Bureau Head, National Logistics Agency, Indonesia; Chief, Quality Control, Nepal Food Corporation, Nepal; Assistant Director of Agriculture, Ministry of Agriculture, Bangladesh; and Assistant Food Commissioner, Food Commission, Sri Lanka.

92. Knowledge transfer through PhD-level research is an integral part of capacity building, but UK aid funding does not fund research at this level *per se*, although it is recognised that a minority of aid projects support this activity. Since 1997, some 28 students from developing countries have registered for and/or been awarded PhDs with funding through HEFCE and indirectly through the DFID's RNRRS as part of partnership arrangements established through the initiative of the programme implementation teams. The number involved are however low and this activity could be increased.

<sup>63</sup> World Bank (2003). Increased donor effectiveness in agricultural support. Working paper prepared for the UN Millennium Project Hunger Task Force. Mimeo 11pp.

93. Bespoke short courses, focussing on specialised subjects, are in great demand, but it is becoming increasingly difficult to obtain funding for these. In the past five years, NRI has delivered over 50 short courses (in-country and in the UK) for which attendees have been sponsored by other aid organisations, for example the EU, FAO, WHO and USAID. Topics range from study tours of the *UK horticulture import and distributive industries* for the Egyptian export industry, to short courses on *Mycotoxins in Food* for the Food and Agriculture Organisation and *Grain Storage Management* for the World Food Programme. This is in comparison to some 10 courses funded by DFID. It is of concern that UK training providers must rely on non-UK funds to share knowledge and build capacity.

94. An alternative to UK-based courses is capacity building of institutions overseas enabling them to build their own training programmes. These have had demonstrably successful results (Box 2 for Central America and Ghana). Distance learning activities are also favoured by many students in developing countries. However, the start-up costs of distance learning can be prohibitive for many institutions. Provision of funds for distance learning has generally been a low priority within the UK aid programme, yet there is a clear market for this activity, with the potential to reach more students than by “conventional” methods.

#### *Implications and key issues*

95. A reduction in DFID funding for projects with built-in training components has seen a reduction in numbers of developing country personnel being trained in the UK on short and long term technical and academic programmes funded through and aligned with the bilateral aid programme in the fields of agriculture and related sciences.

96. The UK academic and technical institutions offer significant capacity to support the human development and institutional strengthening needs of developing countries in topics of current priority relevance to international development and global trade. New funding mechanisms, possibly in partnership with other interested international agencies need to be secured if this UK potential is to be exploited. New mechanisms including distance learning should be explored.

November 2003

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## APPENDIX 40

### **Memorandum from Dr Stephen W Grundy, and Dr James A Wright, University of Bristol**

As academics with a research interest in developing countries, we believe that the UK Government, through DFID or its Research Councils should place more emphasis on basic and applied science and technology to achieve change in living conditions in poorer countries. It seems to us that DFID’s current focus upon demand-lead research places too much emphasis upon issues proximate to delivery of aid programmes and to short-term incremental improvements in the techniques of that delivery.

As an example, in September 1999 we proposed a research project to the European Union’s INCO DEV programme entitled “the policy implications of contamination of rural water between source and point-of-use in Kenya, South Africa and Zimbabwe” (see <http://www.bristol.ac.uk/aquapol> for more details). In December of that year, we were awarded funding of approximately 50% of the amount that we had requested. The UK’s DFID representative for the INCO DEV programme let us know that we had been ranked seventh out of more than 300 applications and offered to contact DFID’s water and sanitation adviser to see whether DFID would be prepared to co-fund the work. The reply that we received was highly critical of our proposal and stated that the problem of point-of-use water quality was “generally recognised”. One paragraph read: “it is not clear what the overall purpose of the project is, what the output will be, or how the results will be used. There is no evidence of demand for the project, and the intended users of the outputs are not identified.” This seems rather at odds with the INCO DEV’s scientific ranking of our proposal! The project has now been running for three years and we are finding clear evidence of poor water quality at point-of-use, even where water has been drawn from improved sources such as wells and boreholes. Other researchers’ contemporary findings are similar. The World Health Organisation has recently emphasised the importance of this issue by launching an “International Network to Promote Household Water Treatment and Safe Storage” and we were asked to co-author the draft research agenda for the network. There is a substantial amount of research required into the problems associated with household water in developing countries, the relationship to diarrhoea in young children and immunocompromised adults and possible treatment and storage methods (see for example Sobsey, 2002).\*

DFID spends around 5% of its budget on development-related research, but it seems to us that these relate too closely to existing developmental practices. Furthermore, unlike other research funding channels, such as the European Union’s 5th framework programme or grants from the UK research councils (NERC, BBSRC, etc.), research funding in some areas does not appear to have been awarded through open competition.

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\* Sobsey, M (2002) Managing water in the home: accelerated health gains from improved water supply. World Health Organisation, Geneva.

We believe that it is important that the UK takes a more pro-active approach to science and technology research for developing countries and consideration should perhaps be given to setting up a separate research council or preferably giving a remit and sufficient funding to the existing UK research councils to include development issues within their scope.

*November 2003*

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## APPENDIX 41

### **Memorandum from the UK Forum for Agricultural Research for Development**

The UK Forum for Agricultural Research for Development is an informal grouping of organisations committed to encouraging research for development including Universities, research institutes, private companies and NGOs. Our range can be appreciated by the undersigned. It is linked to the European Forum and thence to the Global Forum. Unlike many of its international analogues it receives no national funding.

A representative group of members have signed up to the following statement:

1. We are deeply concerned about the decrease in the number and capacity of UK research scientists who are actively involved in work for the benefit of developing countries. Allied to this is reduced access to research infrastructure available in the UK to address developing country problems. This loss is perhaps most striking in the field of agriculture where the UK has an outstanding and distinguished track record stretching over 100 years and where strategic support is especially vital to meet the Millennium Development Goals.

2. There has been over the past decade a total disappearance of any foundation funding to provide a sustainable basis from which UK scientists can provide the high quality scientific partnerships that are crucial to progress capacity building and other activities in developing countries. Such a lack of foundation funding further erodes opportunities for UK institutions to leverage other international funding sources including those of the EC.

3. DFID has now untied funds to enable the sourcing of research from elsewhere in the world including those countries whose support of national efforts has remained more consistent over recent years (eg CIRAD). This will further accelerate the erosion of UK research capacity. The UK needs to continue to lobby for the untying of aid from other developed countries to ensure that the best scientific and technical resources are available internationally to support developing countries.

4. There is further an apparent failure of DFID to learn from the experiences of DEFRA who are reversing some of the consequences of excessive “window-shopping” for research procurement. Such an approach risks reducing overall UK interest in such work. By this policy DFID may also have removed the opportunity for an equitable partnership and dialogue between the UK science base and development requirements and reduced the opportunities for a meaningful dialogue with the Research Councils (whose remit emphasises basic research for the benefit of the UK).

5. Erosion of research capacity will lead to reduced opportunities for UK dialogue with developing countries at all levels and leverage on the international development agenda.

6. Opportunities to systemically link the Higher Education Policy with S&T programmes of relevance to developing countries miss vital opportunities for capacity building of developing country professional staff. This also puts UK scientific and academic organisations at a disadvantage in comparison with those in other European countries.

7. UK research is of the highest international standing and often at the cutting edge of policy development. Despite investments in support of the agriculture, food and natural resources sector, we consider that overall the DFID is missing strategic opportunities with respect to using the available scientific and technical outputs to influence its own development agenda.

*November 2003*

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## APPENDIX 42

### **Memorandum from the Macaulay Institute**

Macaulay Research Consultancy Services Ltd (MRCS) is the commercial arm of The Macaulay Land Use Research Institute (MLURI), a Sponsored Body of the Scottish Executive Environment and Rural Affairs Department (SEERAD). MLURI conducts research on land use and environmental issues in Scotland, the UK, Europe and the rest of the world. The group has an annual turnover of approximately £11 million, of which approximately 70% is provided by SEERAD as grant-in aid. The remainder of its income comes from providing research and consultancy services, provided by its commercial subsidiary company to a variety of

clients, including other government departments and agencies (eg DFID, DEFRA, English Nature, Scottish Natural Heritage, Scottish Environment Protection Agency), the European Commission and the private sector.

The Group has an active programme of research and consultancy, not only in Scotland, but also in other parts of the UK, and throughout South America, East and Southern Africa, and Asia. It has conducted research and consultancy for DFID in Africa and Asia, mainly in the areas of natural resource management and in livelihoods.

We respond to the specific point raised by the Committee from the perspective of our experience as (a) a research organization that provides research in support of a range of government policies, (b) a research contractor to the DFID Renewable Natural Resources Research Strategy, (c) a provider of consultancy services to DFID in the areas of natural resource management and livelihoods, (d) our experience of other research funders and development agencies, principally the European Commission.

*The coordination of research support with Government policy on the use of science in development policy, taking account of the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

Although that there are formal mechanisms by which the different departments consult on research issues and priorities we are not convinced that these are not as effective as they might be. This partly stems from different departments having their own specific research needs and priorities. In our experience the British Council, for example provides excellent, although limited, support for training researchers in developing countries. For example the Higher Education Link (HEL) programmes have been very successful at relatively low cost. The HEL programmes have targeted poverty alleviation issues and promoted science relevant to problem solving by linking higher education and research establishment in the UK with similar institutions in developing countries. This has provided valuable training and capacity building, usually over a three-year period. However, it has not always been easy to secure the necessary funding from other sources at the end of the HEL to take full advantage of the increased capacity, because of differing priorities from other potential funding organizations.

On the other hand there have been some excellent examples of research informing development projects. The Macaulay Institute was involved, for example in a research project, funded by the former ESCOR programme of DFID in Central Asia which had a considerable influence in the development of a project in Kyrgyzstan to support livelihoods in rural areas. This was partly due to the specific interest in research by the then regional senior rural livelihoods advisor in research.

*The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

Scientific advice if available to DFID from a range of sources, including DFID-funded research programmes. There are a range of advisors within DFID who provide scientific input to policy and programme development. However there are a number of barriers to the effective flows of scientific information to the policy formulation process. These include a poor understanding of science by some officials. This could be overcome by the appointment of more staff with a scientific background to official positions. Also many scientists have a poor understanding of the requirements of those who formulate policy and programmes. The secondment of scientists to DFID would help scientists appreciate the needs of and thus, in the longer term, lead to more relevant research and more effective communication of research findings. (It should be noted that we believe that such arrangements would be of benefit within most government departments)

*The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programme*

There is little doubt that the linkages between research funded by DFID (and other organisations) is, in some cases, poor. There are many examples of DFID country offices being unaware of research projects that are being conducted in those countries. Often it is the research team that brings the attention of the project to the country office rather than DFID.

*The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the coordination of these efforts with NGOs, charities and international programmes*

We have no specific comments on this topic.

*The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced*

We have no comments on this issue.

*The extent of scientific and engineering training provided by the UK as part of development policy and subsequent utilization of such training in developing countries*

The UK has an excellent reputation for providing higher education training (Masters and PhD level) to individuals from developing countries in the agricultural, and natural resource management areas. Although in the past some of that training was not always relevant, this has been addressed in the past couple of decades. In the fields of natural resource management many universities now provide courses where the practical aspects of post-graduate training is provided in the student's home country, thus ensuring relevance to the developing country's needs.

November 2003

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## APPENDIX 43

### Memorandum from Jane Thornback, Director, UK Tropical Forest Forum

My own sector is natural resource management, especially forests and biodiversity in the tropics. My experience is based on over 20 years of work on policy issues in this area, especially the UK's obligations/commitments to the international agenda relating to tropical forests and biodiversity. I was an employee of the Natural Resources Institute (NRI) from 1994 to 2001. I have been Director of the UK Tropical Forest Forum since 1989.

My comments are confined largely to Point a:

*The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID.*

I feel there is a potential collapse of the UK's skill base in tropical natural resource management taking place now due to changes in the policy direction of DFID since the mid-1990s. The UK has had a very long tradition in tropical natural resource management and agricultural production which began at the time of Empire. In my view its loss at this time would be a tragic disservice to developing nations.

I do not think that the potential loss of this skill base has been the subject of a considered debate and dialogue across Government. No discussion has taken place as far as I know to quantify the cost of maintaining this skill base at whatever size and whether the option exists of maintaining it in other ways (as part of an Institute of Tropical Science and Management for instance). There appears to be a sad falling through the cracks.

This skill base was for much of its history part of Government service, especially through the colonial service and subsequently through the many institutes such as the Centre for Overseas Pest Research, the Tropical Products Institute, the Oxford Forestry Institute, the Natural Resources Institute etc that provided the expertise to contribute to the UK's aid programme. Even in the first half of the 1990s much of this skill-base still existed. For instance, the UK still had 50–100 tropical foresters, I joined an NRI Tropical Forest Dept of almost 25 people in 1994, it now no longer exists; similarly the Oxford Forestry Institute has declined in activity drastically since the start of the 1990s, it no longer fits in with the DNA research work carried out in Oxford's Department of Plant Sciences.

Because of this history of Government service, the science base for development activities—the tropical foresters, the tropical agronomists, the tropical products experts, the crop pest experts etc and their institutions, found themselves very vulnerable financially when the winds of change occurred in the mid-1990s with the arrival of Clare Short and the new Department for International Development (DFID). It is as if DFID is only part of the spectrum of activities of its predecessor the Overseas Development Administration. That part of the spectrum that is missing/disappearing is the science base for natural resource management and agricultural productivity. It has found itself marooned without a government base and without access to government financial support whether through grant-in aid to institutions or research project funding to scientists.

Whilst DFID would argue that it is not its role to maintain the UK scientific capability in tropical science, the reality is that this sector does not perform well in any University HEFCE exercise since it is largely focused on applied research and is usually derided by the "pure" scientists.

Yet there are other institutions in the UK that have a major tropical focus, which for perhaps random historical reasons come under different UK Government Departments to overseas development, for instance Kew (MAFF and now DEFRA) and the Natural History Museum (DCMS). These important

institutions continue to enjoy considerable grant in aid (and should continue to do so). Indeed within the UK, those involved with tropical ecology also continue to flourish, again their sources of funding have on the whole not been dependent on development funding but on environmental research funding.

Today we speak of sustainable development and the need to manage resources sustainably, yet the irony is that the UK skill base which directly focuses on the question of how do we *manage* tropical resources for long term productivity, and how do we improve tropical agricultural production in developing countries is potentially about to collapse due to a major policy shift in DFID. DFID now seems to believe that tropical natural resource management and improving agricultural productivity are somehow unrelated to poverty eradication. (Is this the age-old UK problem of arts graduates having little knowledge of science!)

One cannot help wonder whether the Oxford Forestry Institute or the Natural Resources Institute (sold to the University sector in 1996) would be in a much healthier situation today had they come under MAFF/DEFRA.

Point a) asks about the coordination of research support with Government Policy. If there is any coordination it is not apparent. The research councils do not see themselves as funding applied research for development in the tropics, since this has always been the responsibility of the overseas budget. Yet the overseas budget now also does not think it is its responsibility to maintain a science base (DFID's Renewable Natural Resources Research Strategy (RNRRS) is due to finish in 2005). The skill base developed literally over centuries will thus be lost, seemingly without any discussion across Government of whether this is sensible, and whether different mechanisms can be developed to fill the void created by DFID's changing policy.

As one example, DFID's Forestry Research Programme has radically altered to meet a more livelihoods and poverty focus from the heyday of plantation expertise, the programme has achieved much, yet one feels the question of whether it would be useful to "move" this to some other umbrella than DFID, seems not to have any forum in Government where it can be discussed.

The UK will continue to be able to contribute to the identification of the planet's biodiversity and to contribute to the understanding of ecological systems in the tropics, but the vital next stage of how does that scientific knowledge help to manage the resources sustainably or to improve agricultural production is a skill base that the UK still has but seems prepared to abandon. This to me is a great disservice to developing countries. I am delighted that the Parliamentary Inquiry has brought this subject out into a more public debate.

November 2003

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## APPENDIX 44

### Memorandum from the University of Wales, Bangor

The University of Wales, Bangor has much experience in natural resources research (in agriculture, forestry and fisheries) for overseas development. Much of our work has been funded by the DFID Renewable Natural Resources Research Strategy (RNRRS) and we consider that RNRRS has delivered many outputs that are benefiting the poor. Such research outputs have made UK assistance very effective by allowing long-term collaboration between developing country researchers and our university scientists who have considerable expertise in developing country problems. However, we are concerned that under current DFID plans for research policy, these experiences will not be built on and we fear that, unless there is special provision for long-term support for collaboration between UK and developing country scientists, then the experience gained in the RNRRS will not be fully exploited.

We wish to comment on the following points:

*Co-ordination of research support with Government policy on the use of science in development policy* is inadequate in our experience. For example, where they fund more applied renewable natural resources research, the focus of the research councils is often narrowly on the needs of the UK. It is unclear which section of Government has the remit to fund core science relevant to the needs of developing countries.

*Means by which DFID acquires and uses scientific advice:* UK institutions have built up considerable competence in the management of renewable natural resources in developing countries. This is now threatened by an apparent lack of appreciation of its value by DFID, which is preventing a continuity of funding.

*DFID's country-level development programmes:* There is a sad lack of connectivity between the RNRRS and country programmes. Although there are good examples of research projects having an impact at a country level this has generally been in spite of, not because of, co-ordinated links between these two areas of DFID's activity.

*Training:* Scientific and engineering training is needed at many different levels in developing countries. There is a continuing important role for UK institutions in delivering high-level training in up-to-date scientific and engineering issues, which is required by developing countries, through taught degree courses, the supervision of research degrees, and short-courses. In addition, many RNRRS research and

development projects involving collaboration between UK and developing country institutions have included a valuable element of training, and less formal scientific exchange. Our experience of the demand from a wide range of developing countries is that they need training in good current science, not just an exclusive emphasis on the social aspects of development, although we appreciate that these are also important.

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## APPENDIX 45

### Memorandum from the International Livestock Research Institute (ILRI)

The International Livestock Research Institute (ILRI) based in Nairobi, Kenya and working worldwide, helps reduce poverty, hunger and environmental degradation through global livestock research. ILRI is one of the 16 Future Harvest Centres supported by the Consultative Group on International Agricultural Research (CGIAR). ILRI is funded by more than 50 private, public and government organisations, including the World Bank and the United Nations, and collaborates with more than 500 national, regional and international institutes, in addition to non-governmental organisation and private companies.

The International Livestock Research Institute has a long-standing relationship with UK research and development institutions and has been receiving financial support by DFID and its precursors.

The comments refer specifically to points 3, 4, 5 and 6.

#### 3. *The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes*

DFID's country program in Kenya has supported the Smallholder Dairy Project (SDP). This is a research and development project jointly implemented by the International Livestock Research Institute's (ILRI) Market Oriented Smallholder Dairy Team, the Kenya Agricultural Research Institute (KARI) and the Ministry of Livestock and Fisheries Development (MoL&FD). As well as research activities into production, marketing, consumption and policy issues, the project has activities to implement a strategy of policy and institutional reform, based on the research evidence, in order to maximise the impact of the research evidence on poverty reduction. This project clearly documents the use DFID makes of research as an input into pro poor policy reform.

As an input to the design of agricultural policy by the new government of Kenya, the DFID rural advisor facilitated policy dialogues involving a range of actors. Researchers engaged in DFID supported projects and others were invited to contribute to this process. The Kenyan case clearly shows how DFID's country programme uses research both at the specific project level but more importantly as an input to broad policy discussions with the new government.

#### 4. *The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes*

The synergies between the UK efforts to build research capacity in developing countries and international programmes such as the CGIAR and specifically ILRI are multiple. The UK funding support to ILRI has enabled the Institute to undertake research which has contributed to diverse policy and investment decisions.

With UK financial support ILRI developed livestock and poverty maps which have assisted ILRI, DFID and a number of other agencies in setting geographic priorities for livestock related research and development investments.

Similarly, ILRI developed an Animal Health priority setting process which has contributed to Wellcome Trusts decision to issue a call for proposals totaling to £25.

UK engagement in international research for development creates a capacity of understanding and managing development programmes. Examples of this are the cases of several UK nationals previously employed at ILRI who have taken up positions within DFID, British NGOs and other development related institutions.

UK support for international research for development has clear benefits to developing countries and also important benefits to the United Kingdom. Research issues are becoming increasingly global and exposure of UK research scientists to these problems constitutes an effective way to develop the domestic capacity. Issues such as climate change or emerging tropical disease research are particularly good examples of addressing developing country problems and simultaneously increasing preparedness for addressing risks to the UK economy and society.

5. *The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced*

DFID attributed funds have also supported research on the development of an improved sub-unit vaccine for East Coast Fever (ECF)—a major killer disease of cattle in eastern, central and southern Africa, whose major impact on poor livestock keepers is to increase their vulnerability by threatening their livestock and other assets. This project applies new scientific advances in genomics, immunology and vaccine development to produce an efficacious, inexpensive and easy-to-deliver ECF vaccine through a public-private partnership. Antigen genes selected using sequence data produced by The Institute for Genomic Research (TIGR) and a random cDNA library generated in partnership with the Ludwig Institute for Cancer Research in Belgium, were screened using an in vitro high throughput immunological assay developed at ILRI. ILRI and partners have identified eight candidate antigens through this testing, which are being evaluated in cattle protection trials using proprietary delivery technology provided by the pharmaceutical company, Merial Ltd, and the DNA/pox virus prime/boost vaccination strategy developed by the University of Oxford. This unique public-private partnership builds on the comparative advantage of the different partners to develop a process that can more rapidly bring research results to poor livestock keepers.

DFID took a bold step in supporting ILRI and partners to apply a very novel genomics approach to develop the ECF vaccine. Before approving this grant DFID required detailed feasibility studies which involved the private sector, thereby insuring that once proof of concept is achieved, the probability of uptake by the private sector is high. The private sector partner (Merial) accepted to provide proprietary vaccine delivery technologies.

This example highlights the respective role of DFID supporting public research but making the support conditional on private sector partners endorsing the feasibility of the approach and providing some of their intellectual property.

DFID has pioneered this approach and is expanding it by actively promoting the creation of an Animal Health Alliance involving private sector animal health companies and donors to address important tropical animal health constraints through this public-private partnerships.

6. *The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries*

Research projects executed by ILRI receiving DFID funding have generally included training of developing country nationals. These training programs have included research related to the projects' agenda and thus have enabled ILRI and its UK partners to do hands on capacity building in research. Many of these researchers are seconded by partner organizations to ILRI for the training period and continue active in the field after completing their time at the institute.

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## APPENDIX 46

### Memorandum from the International Center for Tropical Agriculture

1. The International Center for Tropical Agriculture (CIAT) is a non-profit, non-governmental organization that conducts socially and environmentally progressive research aimed at reducing hunger and poverty and preserving natural resources in developing countries. CIAT is one of 16 food and environmental research centers working toward these goals around the world in partnership with farmers, scientists, and policy makers. Known as the Future Harvest centers, they are funded mainly by the 58 countries, private foundations, and international organizations that make up the Consultative Group on International Agricultural Research (CGIAR), of which the United Kingdom is an important member.

#### THE NEED FOR AGRICULTURAL RESEARCH IN A CHANGING WORLD

2. About 1.2 billion people, one-fifth of the world's population, are "absolutely poor," each living on less than one US dollar a day. For two-thirds of these disadvantaged people, mostly women and children, poverty also means hunger, leading to malnutrition and declining health. The plight of the poor is made worse by environmental damage, including the massive destruction of ecosystems, loss of biodiversity, chemical pollution, soil and water degradation, and accumulation of greenhouse gases.

3. Still more worrying, as highlighted by the Proceedings of the International Conference on Sustainable Food Security for All by 2020, held in Germany in September of 2002, in the period 1980–98, the per capita food consumption index in the least developed countries (LDCs) has declined to 94, while for developing countries it has improved to 140. As a result, the number of undernourished people in the LDCs has doubled, or 40% of their total population.



4. While economic and technological progress in the past century has actually cut the proportion of the world's people who are poor, the "absolute" number of the poor remains staggeringly high. Persistent poverty, together with widespread environmental degradation, are two of the most pressing problems facing humanity at the outset of the 21st century.

5. Most of the tropical world's poor people live in rural areas where the daily struggle for survival depends largely, for the time being at least, on productive farming and wise stewardship of the land. This reasoning also extends to the fight against urban poverty. Efficient, sustainable production of crops and animals in the countryside keeps food prices low in city and town markets. This benefits poor urban consumers, who typically spend a much larger part of their income on food than do people in industrial countries.

6. The moral imperative to fight poverty and environmental destruction in the tropics through better agriculture and natural resource management has been a common and constant preoccupation of development agencies, including DFID for many years. Yet, the global context in which solutions must be planned and applied to local or regional realities is rapidly changing. It is both necessary and prudent that actors in the development community take stock of emerging trends, explore the potential for exploiting recent scientific advances, and envision a future of truly sustainable rural livelihoods.

### *Globalization*

7. Globalization presents both opportunities and challenges to CIAT, its clients, and partners. On the one hand, advances in communications, information, and transportation have made the lives of the world's people more interconnected than ever before—politically, socially, and economically. Trade barriers are falling, making for freer movement of goods, services, and capital across borders. These changes are accompanied by the rise of institutions with global reach, among them large non-governmental organizations, multinational corporations, global environmental conventions, and international scientific networks, like the Future Harvest centers of the CGIAR. Such trends offer the promise of greater scientific collaboration, joint efforts to solve global problems, fast technology diffusion, and new market opportunities.

8. On the other hand, globalization presents the risk of disadvantaged people being further marginalized. The poor of low-income countries are particularly vulnerable. They lack the power to adapt to and exploit global integration—be it political power, information power, market power, or the organizational power to change their circumstances. Without compensatory mechanisms, the tropical world's poor risk having the open door of expanding international opportunity slammed in their faces.

9. In the coming decades, most poor people will be concentrated in tropical rural areas of Africa and Asia, although parts of South and Central America continue to suffer from chronic poverty. While the fight against poverty and hunger in these areas demands greater food production and food security, that task is complicated by continuing population growth and expanding food demand. At the same time, recent evidence suggests that the pace of advances in agricultural productivity is slowing. Thus, a major threat looms: the prospect of a gap between food availability and people's needs.

10. Even if overall global food supplies remain adequate, international trade cannot be counted on to distribute food through market channels to people who lack purchasing power. This applies particularly to remote rural communities, where transport costs are high. Millions of rural families need higher incomes to guarantee their long-term food security. Agricultural livelihoods will continue to be the major source of that income.

### *Human and ecological health*

11. Agriculture is widely recognized as damaging to the environment. It has reduced biodiversity, depleted soil and water resources, and caused contamination and health problems through widespread and often excessive use of agrochemicals. It is also a major contributor of two major greenhouse gasses, methane and nitrous oxide. Although environmental degradation is a major problem in the tropics, poor farmers are not in fact its major cause. Their livelihoods, though, are disproportionately harmed by the cumulative effects, and the rural poor have fewer resources at their disposal to take corrective or adaptive action.

12. Human health figures prominently in the global agricultural equation. While people depend on farm-based food production for adequate nutrition, including mineral and vitamin micronutrients, unsound agricultural practices are widespread and often undermine human health. For example, excessive pesticide use, besides threatening the natural environment, can also poison people, through direct contact in the field or pesticide residues in food.

### *Land degradation*

13. It is important not to blame the poor for land degradation. That would be equivalent to blaming the victim for the crime. Land degradation and poverty have common causes that are mutually reinforcing. Land degradation is the reduction of economic or ecological outputs of ecosystems. It is a global problem worsening in severity due to increasing human pressures that place excessive demands upon limited natural

resources. At present, approximately 35% of agricultural land in Asia and 45% in South America is degraded. But in Africa and Central America, degradation afflicts even larger areas, 65% and 74% respectively (Heerink et al 2001).

14. Livelihoods of resource-poor farmers are the most affected and vulnerable. Land degradation diminishes the resilience of their agroecosystems to withstand shocks (eg weather, climate) and reduces the number of land management options that are both sustainable and profitable.

15. Global warming, for example, will likely cause potential crop yields in most tropical and subtropical regions to decline. And overall, climate change is expected to slow the growth in world food production, resulting in higher food prices and added pressure on poor people. Food security is expected to worsen in Africa especially, the region least able to cope with such a blow. Thus we have to make particular emphasis on improving the capacity of these kind of farmers to cope.

16. Understanding the fundamental causes of land degradation is crucial. Overall, land degradation reflects a combination of biophysical processes and socio-economic driving factors such as:

- Land conversion, including forests and wetlands;
- Inappropriate agricultural management practices which are driven by policies and incentives that allow and encourage them; and
- Trade-related incentives

17. Land degradation is characterized by loss of agrobiodiversity, poorer soil nutrition, organic matter and biological organisms, an increase in toxicity associated with both natural and human causes, soil erosion and compaction, as well as weed infestation and other biophysical measures that scientists can quantify.

18. Researchers agree that preventing the long-term impacts of degradation on productivity and environmental quality is a major challenge. When we talk of land degradation we are not dealing only with the soil, we are dealing with the humans beings that extract their living from the soil. Public policies, both national and international, often hinder rather than facilitate adoption. Such policies include agricultural credit, taxes, quotas, subsidies, and protective tariffs.

#### *Research as a progressive force for change*

19. In this evolving context, CIAT seeks to be a socially and environmentally progressive force for change, conducting research relevant to the current and emerging problems of the world's disadvantaged people. We also recognize that pressing problems like land degradation, global warming, poverty, and hunger are not amenable to simple solutions. The complexity of these issues surpasses the ability of any individual scientist or institution to solve them alone.

20. Effective “solutions that cross frontiers” require a multidimensional, multipartner approach, extending beyond scientific research. To this end CIAT works, and will continue to work, through institutional alliances—with other Future Harvest centers, public agricultural research organizations in tropical countries, advanced research institutes in industrial countries, private-sector research, and civil society groups such as nongovernmental organizations with grassroots development expertise. International ODA programs and development agencies such as DFID will continue to play a key role in guiding and supporting these multidimensional efforts to address complex problems.

#### SUSTAINABLE RURAL LIVELIHOODS: A VISION FOR THE FUTURE

21. We believe that improving the livelihoods of small farmers through high-quality science is a highly effective and direct way to address the needs of the tropical world's rural poor. The notion of sustainable rural livelihoods is at the core of CIAT's vision.

22. The sustainable livelihoods pursued by disadvantaged rural people should lead to the specific outcomes they desire. These include greater food security, reduced vulnerability to outside threats, improved family health, higher incomes to buy what cannot be produced, and a stable and productive natural resource base. In short, sustainable livelihoods are those that allow people to continuously and systematically build their physical, economic, and social assets, thereby giving them more control over their lives.

23. CIAT recognizes, however, that science-driven agriculture is just one of the ingredients needed to achieve sustainable rural livelihoods. Higher crop yields, reduced soil erosion, and effective use of new pest control technologies, for example, are by themselves not enough. Non-farm assets and solutions must also be nurtured. Moreover, the journey from starting point to final destination—from the lofty ideal of sustainable livelihoods to the practical outcome of accumulated assets for rural communities—can be a long one.

24. As a research center specializing in people-centered solutions for tropical agriculture, CIAT uses science to help people get to three intermediate destinations along their path. These interdependent “critical conditions” are competitive agriculture, agroecosystem health, and the social capital needed for collective rural innovation.

*Competitive agriculture*

25. For rural livelihoods to be truly sustainable, it is not enough for small farmers to produce only enough food for home consumption. They must also earn cash to pay for life's other necessities, like medicine and school supplies. Selling part of their harvest is a key strategy.

26. With rapid urbanization in many low-income tropical countries, domestic markets for agricultural products are growing. Farmers need to move beyond traditional rural markets to respond to demand from cities and towns. In this expanding economic arena, small producers are not alone. They are often up against large, well-capitalized agribusinesses. And with the emergence of freer international trade, both through regional trading blocks and globally through the World Trade Organization, the pressure of competition is increased.

27. Intensification, diversification, and higher value added are mutually reinforcing tactics to make small farmers more competitive. Intensification boosts the productivity of land, labour, and other limiting factors—for example, through higher yields, better on-farm nutrient cycling, and more effective pest control. It does not necessarily imply heavier reliance on off-farm inputs, like purchased agrochemicals, since proven management methods are available to exploit on-farm renewable resources more efficiently.

28. Diversification helps farmers manage risk. Options include cultivating different varieties of the same crop species, introducing higher value species to their existing mix of staple crops, and integrating livestock with crop production. Diversity is essential at different scales: from the level of the farm field (crops and animals), to household level (different productive activities), to the landscape level (diversity in land use).

29. Two key strategies for adding value to production, which are also forms of diversification, are to adopt genetically superior varieties and to process some or all of production after harvest. For example, small farmers can grow cassava with improved starch quality, process it through cooperatives, and then sell it profitably to large agroindustries. Or they might grow popping beans—a traditional Andean food—and then package them as prepared snack foods for urban markets.

*Agroecosystem health*

30. Degradation of natural resources is a major enemy of small farmers. Threats to the agroecosystem come in many intertwined forms: soil erosion, compaction, nutrient depletion, and acidification, shrinking or contaminated water supplies, loss of vegetative cover, reduced biodiversity, and greater susceptibility of crops to pests and diseases. Some problems are acute and highly visible, others chronic and more subtle. Resource degradation undermines farmers' ability to compete in the market and sometimes has detrimental effects off-farm, especially in downstream communities. A healthy agroecosystem, like economic competitiveness, is essential to the sustainability of rural livelihoods.

31. Healthy ecosystems tend to be diverse, marked by a wide range of land uses and a high level of biodiversity. Knowledge of this diversity has proven valuable, for example, in efforts to reestablish seed production systems in Africa after disasters. It is also essential to promoting synergies between human health and agroecosystem health.

32. Fragile environments, upon which so many poor farmers depend for a living, require special attention from research. If properly managed, natural resources in vulnerable settings, such as hillsides, can be quite productive and may be systematically improved. Evidence suggests the returns to research on the problems of such agroecosystems can be significant.

*Social capital for rural innovation*

33. Some aspects of ecosystem health and agricultural competitiveness cannot be managed by single producers acting on their own. Protection of soil, water, and forests, as well as pest control, often require collectively designed solutions applied beyond the scale of the single field or farm. By the same token, group action to acquire information on technology and markets goes a long way to ensuring that small farmers remain competitive.

34. Successful collective innovation by rural communities depends on the presence of social capital. This includes assets like competent leadership, community spirit and trust, experience gained through farmer participatory research, indigenous knowledge of the land, networks of people, and group access to external information. From the experience of working together, community members learn new skills and refine their judgment about what works and what does not. These new assets can then be harnessed for future community action, not only to improve agriculture, but to satisfy other needs, such as access to education, clean drinking water, and health services.

35. Easy access to external information sources, like the Internet, is still beyond the reach of most individual small farmers. However, shared services, such as community telecenters, offer new opportunities for social capital building and informed collective action on resource management, product marketing, and other community issues.

36. In Bolivia, the Fomentando Cambios (FoCam) project is an exciting example of how local stakeholders—supported and backstopped by the Bolivian government, development NGOs, the CGIAR and donor agencies like DFID—are becoming key actors in formulating research demands and gaining control over the development and extension efforts that serve them. DFID—Bolivia is a member of a multi-institutional “accompanying group” that provides guidance, feedback and opportunity-identification advice to the project. Other donors, municipalities, government agencies and research and extension providers are also members of this group. CIAT shares its knowledge in participatory research and extension methodologies and seeks to help merge this external knowledge with local wisdom, experience and methods. A hypothesis of this project is that “the poor”, when empowered with methodologies that help them gain more control over their social and productive environments are more able to overcome production and trade restrictions and improve their living conditions. This is a perfect example of the central focus of CIAT’s rural innovation approach: that communities become agents of their own change.

37. The project also has an academic component: members of its staff are now initiating higher education degree programs in the UK. Their dissertations will be directly connected to problems encountered in several of the project’s dimensions.

38. The FoCam project is making an important effort to manage these components as an integrative system. DFID’s contributions in support of the CGIAR is essential not only to provide a scientific basis for development action but also facilitates working within a multiple stakeholder scenario to propose a holistic managerial approach that links key actors at all levels into the development stream.

#### SCIENCE FOR DEVELOPMENT

39. Genomics, agroecology, and informatics are three advancing areas of science and technology with enormous potential for addressing the interrelated problems of rural poverty, food insecurity, and environmental degradation. Molecular markers, for example, are now routinely used by CIAT and other research organizations to identify valuable plant genes, map entire plant genomes, and otherwise exploit the genetic diversity of important crop species, their close relatives, and wild ancestors. Increasingly, marker technology is also used to speed up selection and breeding of superior crop lines. These are plants that resist diseases and pests, yield well, have good nutritional content, and tolerate physical stresses.

40. Agroecological research is rapidly improving our understanding of complex links between plants, water, soil nutrients, and associated organisms, both harmful and beneficial. It presents new opportunities to make tropical farming more productive, economical, and environmentally friendly, as well as safer for farmers and consumers. For example, soil structure, fertility, and nutrient cycling can be improved through wise management of crop residues. And by manipulating the behavioural interactions between pest populations and their natural or introduced enemies, farmers can control pests effectively without resorting to excessive pesticide applications. Agroecology-based solutions not only improve the lot of poor rural producers. They also ensure a safer, more reliable supply of food to poor urban consumers and to expanding export markets in industrialized countries.

41. Advances in informatics, especially enhanced computing power and speed, underpin many recent scientific developments in agroecology and genomics. They also pave the way for farmers and rural communities to use information-intensive technologies. Of special significance are new opportunities for modeling complex systems, such as those involved in pest ecology, landscape dynamics, soil nutrient flows, and collective decision making.

42. Where processes are too complex for classic experiments, in which just one or a few variables are analyzed, improved modeling tools offer scientists a powerful alternative. But other stakeholders also stand to benefit as computer interfaces become more user-friendly and the costs of storing, analyzing, and communicating data drop. With this downstreaming of modeling tools, new opportunities arise for fuller community involvement in agroecosystem management. However, further research is needed both on the underlying modeling systems and on the social arrangements that will permit varied stakeholder groups to fully exploit these tools.

43. CIAT’s application of scientific competence to promote sustainable rural livelihoods integrates its wealth of past research experience with recent scientific advances such as those mentioned above. The particular competency focus of CIAT is five-fold:

- Agrobiodiversity and genetics;
- Ecology and management of pests and diseases;
- Soil ecology and management;
- Land management; and
- Socioeconomic analysis.

44. This combination has distinct strengths. Each area of competence has significant scope to contribute to and benefit from scientific advancement. And each can help CIAT and its partners to achieve a direct, positive, and lasting impact on rural livelihoods in the tropics. Furthermore, these core competencies are

highly complementary, allowing for integrated approaches to problem solving. Together, they form an enduring and stable institutional framework, at the same time giving CIAT the flexibility to respond to an evolving research agenda.

#### *Agrobiodiversity and genetics*

45. Agrobiodiversity is central to the livelihoods of the rural poor. In the CGIAR we have been putting emphasis on increasing the productivity of a subset of the total agrobiodiversity. We need a more holistic approach: one that looks at the totality and not just the component parts.

46. The recognition of the necessity to conserve and manage biodiversity at large scales—such as watersheds and regions—has been recently recognized. As a result of the increasing research effort over the last five years, we are in the process of better understanding agrobiodiversity at different scales and types, primarily thanks to the tools provided by spatial analysis and biotechnology which allow us to deepen our knowledge on the nature of biodiversity and its functions.

47. Access to high-quality germplasm—for staple crops like cassava, beans, and rice, as well as alternative high-income crops—remains a high priority for small farmers. Genetic research, applied to conserved and characterized agrobiodiversity, leads to higher crop productivity, improved plant and soil health, and better human nutrition. Advances in molecular biology and ecology have markedly improved our understanding of agrobiodiversity in the centers of origin of crops. This has led to better strategies for conserving genetic diversity and improving crops.

48. The application of molecular genetics and genetic transformation technologies is helping overcome basic obstacles encountered in traditional plant breeding, at the same time make breeding more efficient. New opportunities exist for unlocking the vast genetic diversity found in the wild ancestors and close relatives of cultivated crops. Plant breeders will be better able to address challenges posed by climate change and by physical stresses on food and fodder production, such as drought and high soil acidity. There is also considerable scope for genetically based improvements in crop yields, micronutrient content (for better human health), and resistance to pests and diseases. Once the hitherto unexploited genetic diversity is introduced into domesticated crops, it will have an enormous impact on agriculture, including the livelihoods of poor farmers.

49. Besides being key tools in crop improvement per se, genetic techniques and agrobiodiversity studies are also being targeted on insect pests, disease agents, and beneficial soil organisms. Work in this area has great potential for improving plant and soil health.

50. CIAT pursues a holistic approach to genetic improvement, taking into account both productivity and agroecosystem health concerns. Strong capacity in training and technology transfer to developing countries is an important element of the Center's strategy, as is an emphasis on developing germplasm that requires fewer agrochemical inputs and is better adapted to contrasting environmental conditions. Partnerships with other research institutes to develop strategic capacity in the areas of gene expression, gene function, gene cloning, and bioinformatics are critical to ensure that developing countries receive the benefits of scientific advances.

51. Public agricultural research programs have long been CIAT's key partners in germplasm development, conservation, and deployment. However, private research firms, seed companies, growers associations, and development NGOs now play a major role in this work. Increasingly, private organizations possess intellectual property, technology, and other assets, access to which is essential for public R&D. CIAT plans to work more closely with private and quasi-public institutions, as a complement to its still vital partnerships with public R&D agencies.

#### *Ecology and management of pests and diseases*

52. Crop damage by bacteria, fungi, viruses, insects, and other pests is a perennial risk in farming and can deal a knockout blow to rural livelihoods, especially if producers are poor, with little else to fall back on. In direct response to such threats, farmers all too frequently apply pesticides repeatedly and excessively. Unfortunately, this strategy can damage the environment, incomes, and health of farm families and other consumers. Pesticides are expensive and, ironically, often ineffective. In some cases their use may actually worsen pest problems. They can also contaminate water sources and food and kill nontarget organisms, resulting in loss of biodiversity. And as tropical farmers attempt to boost their incomes by growing high-value fruits and vegetables, they may find that inappropriate pest management tactics deny them access to lucrative international markets.

53. Safer, more effective alternatives to pest control, based on better understanding of agroecologies, usually combine several elements. These include the use of crop varieties with genetically based resistance to pests and pathogens; biological control (fighting pests with their natural enemies); and better farm management practices. Judicious use of agrochemicals may also be involved.

54. The genetics of plants and pests are now better understood at the molecular level. This knowledge is crucial to developing crops with stable resistance. Likewise, analysis of the behavioral interactions between pests and their natural or introduced enemies allows for more effective biological control. While new habitat,

crop, and soil management strategies also contribute to pest and disease management, their effective use can only be based on detailed understanding of the social and economic conditions influencing farmer decision making and practices.

#### *Soil ecology and management*

55. Healthy, fertile soil is vital to overall agroecosystem health, agricultural productivity, and competitiveness. It therefore bears strongly on the sustainability of rural livelihoods. In poor tropical countries, the concern is not merely to avoid soil problems like erosion, compaction, and nutrient depletion, but also to enhance the quality of the resource, especially where degradation is already a problem.

56. The value of soil, of course, extends well beyond the farm. It is also a public “ecological service”: a regulator of water quality and supply, a way to break down contaminants through microbial action, and even a carbon sink to slow greenhouse warming. How tropical farmers manage soil is relevant not only to their livelihoods but also to the survival of all terrestrial life. The fair and coordinated use of soils by different stakeholders, at different physical scales from local to global, requires multidisciplinary analysis of the tradeoffs involved. The idea of managing soils with these often-competing interests in mind is relatively new; in the past the approach was more fragmented and monodisciplinary.

57. Today, soil is viewed holistically, as a complex living system. Emphasis is put on managing fertility based on better understanding of factors such as nutrient flows through plants and soil organisms. Applying green manures (plants which, when cut and left to compost, build up soil organic matter) is one of many practical ways to improve soil structure and fertility. But for small farmers to fully exploit such methods, they need easy-to-use decision support tools and locally valid indicators of soil quality.

58. Many plant pests and diseases are soil-borne. So, their behavior is strongly influenced by soil conditions. Similarly, soil nutrient factors directly affect plant nutrition. Soil management and soil research, therefore, cannot be separated from pest and disease management and genetics research. They must be integrated, with soil biology playing a central role. Solutions to plant and soil health problems will involve a mix of strategies: genetic improvement, application of ecological principles, and carefully targeted use of control measures, such as natural enemies, biopesticides, and selected chemicals.

59. One underexplored aspect of soils is their immense biodiversity and the role of constituent organisms in agroecosystem processes. Fortunately, molecular techniques and the ability to isolate genetic material from soils have opened up new frontiers for agricultural research for the developing world.

60. CIAT places strong emphasis on soils research and management as part of an overall agroecological strategy for conserving and enhancing natural resources, especially in areas at high risk of degradation. Research methods are designed to ensure strong farmer participation, stimulate collective action, and take advantage of local knowledge.

#### *Land management*

61. A key goal of CIAT’s land management R&D is to enable farmers to produce more food and fodder with less land and fewer risks to the environment. This recognizes that competitive agriculture and environmentally sound stewardship of natural resources should and can be complementary. However, land use decision makers, whether local farm communities or national government agencies, need appropriate data and tools to analyze trade-offs at the geographical scales that concern them. In practice, this means being able to estimate costs and benefits of various land-use options, including nonagricultural uses, such as tourism and conservation. The ability to identify and resolve potential conflicts between land uses at various scales is also important.

62. At the farm-field level, crop models can predict the impact of adopting improved germplasm or new cropping methods. Parallel decision-support tools can help with analysis of the overall farming system—everything from employment and income, to land productivity and the quality of natural resources. Geographic information systems (GIS) allow farm-level behavior to be modeled at the watershed level, so that the effects of scaling up can be predicted for factors such as resource degradation or improvement. They also allow for fuller consideration of issues like investment in infrastructure, accessibility to markets and services, and off-site effects of prospective or actual land uses. Land-use planners can simulate the impacts of innovations, using models, or monitor actual effects, using a combination of field measurements, surveys, and satellite images.

#### *Socioeconomic analysis*

63. Understanding how individual farmers and communities make decisions is crucial to the success of new technologies for improving rural livelihoods. Socioeconomic analysis is the core competency that supplies CIAT scientists with insights and empirically validated principles for designing people-centered solutions and evaluating their impact. It relies heavily but not exclusively on participatory methods.

64. Our social scientists will continue to provide valuable research products such as models, databases, and policy recommendations. But they will also add to their already substantial portfolio of manuals, guidelines, and training materials for use by partners such as community groups and local development organizations.

65. To manage their natural resources sustainably, individuals or families must sometimes sacrifice their personal, often short-term interests for the sake of longer term group aims. Social scientists can usefully analyze individual and group incentives for adopting or rejecting a particular innovation, as well as the possible outcomes.

66. Often, it is difficult for decision makers to anticipate the outcomes of their decisions about natural resources, like soils and biodiversity. Moreover, decisions made by one group may have unexpected consequences for another. Modeling research can better enable individuals or groups to foresee the effects of their decisions and actions.

#### GLOBAL AND REGIONAL STRATEGIES

67. CIAT's research program fits into a global context, namely the work of the international agricultural research centers of the CGIAR. Some CIAT outputs, such as conserved agrobiodiversity, are essentially global public goods. Work in this and other areas, however, will continue to be harmonized with regional research agendas.

68. Key domains of CIAT's work have a global reach. They contribute to sustainable rural livelihoods in all three target regions of the world, even though research may be conducted in specific sites. Among these research topics are beans, cassava, and tropical forages, including genetic conservation and enhancement of these three crops, as well as participatory research methods, agroenterprise development, and management of natural resources.

69. Special emphasis is placed on the needs of hillside agroecosystems in Latin America and the Caribbean, the region in which CIAT has its headquarters. The hillsides of Central America and the Andes are a locus of poverty and are highly susceptible to natural resource degradation. Research on these agroecosystems therefore fits well with CIAT and CGIAR objectives.

70. Specific CIAT strategies also apply to agroecosystems in the uplands of Asia and the highlands and midelevation areas of central, eastern, and southern Africa, areas with large numbers of poor people. These agroecosystems have many crops and natural resource problems in common with Latin American hillsides. CIAT works closely with partners in all three regions to define research activities with both global and regional dimensions.

#### *Meeting the threats and seizing the opportunities*

71. During 2002–03, CIAT scientists identified three issues of global significance to which we can make significant contributions. This was intended as a research-grounding exercise, the establishment of an institutional “compass” to keep our work relevant to the needs of large numbers of poor people throughout the tropics. The selected research themes are:

- the restoration of degraded lands to social profitability;
- the conservation of agrobiodiversity; and
- rural innovation.

72. Under each global theme, CIAT researchers will apply their expertise in clearly defined projects and locations across the regions in which we work. We do not believe this to be the only way forward, but we feel these are the areas where CIAT—in close collaboration with its partners—can make a major contribution to improving rural livelihoods.

#### *Restoring degraded lands to social productivity*

73. What is new in our approach is the emphasis on restoring degraded lands to social productivity. This means restoring their ecosystem services and the asset base of the rural poor. Practically this involves combining stress-adaptation in crops with research to improve soil health and quality. Small investments by farmers in improving their soil fertility will have quick payoffs in increased productivity.

#### *Prevention strategy*

74. For areas currently showing little degradation and for areas of high social or environmental value (eg tropical forests), policy interventions are key to the prevention of undesirable land conversion and subsequent degradation. Many of the issues are beyond the scope of CIAT's mandate and expertise. However, there are specific areas where CIAT can make key contributions to broader policy reform processes. CIAT with its partners would spend approximately 10% of its efforts on land rehabilitation in these areas.

#### *Reduction strategy*

75. For agricultural areas showing moderate degradation, “traditional” CGIAR and National Agricultural Research System (NARS) work on sustainable land management will continue to attempt to reduce degradation trends exacerbated by population and poverty growth. These R&D initiatives will be conducted in selected hillside crop and livestock systems of South America and Asia.

#### *Reversal strategy*

76. Restoration or reversal of land degradation faced by the poorest on the most vulnerable systems is the biggest challenge. Crucial to the success of efforts here are new crop and forage components, which are adapted to major biotic and abiotic constraints, and innovative technical management options. However, dramatic changes in policy environments and market access will likely be necessary. About 60% of CIAT’s efforts with its partners will be allocated to recover systems facing severe degradation. Targeted efforts include the rehabilitation of degraded land in Sub-Saharan Africa, eroded hillsides in Central America, the Caribbean and Asia with diversified and higher-value crops, and restoration of Imperata grasslands in SE Asia and pastures in the Amazon.

#### *Expected Benefits*

77. The R&D strategy proposed here will generate numerous socioeconomic and environmental benefits consistent with the Millennium Development Goals. These include environmental sustainability, eradication of extreme poverty and hunger, promotion of gender equality and empowerment of women, and the development of global partnerships.

78. Combinations of adoptable technologies that are profitable in the short- and long-term will enable farmers to improve their livelihoods and make their farming systems more resilient in the face of change, while improving and protecting the agroecosystems on which they and others depend. Participatory approaches that engage civil society will not only help meet the needs of the poorest (including women and children) but will also enhance their social capital and thereby their ability to take advantage of new opportunities. A comprehensive understanding of the dynamic biophysical and socioeconomic forces that underlie land degradation, combined with participatory R&D, will foster better public and private decision making on investment and management opportunities that restore degraded lands. Building public and private sector capacities to participate effectively in the emerging global economy will ultimately lead to sustainable, long-term development.

#### *Enhancing and sharing the benefits of agrobiodiversity*

79. One important consequence of the rapid global changes described earlier is that countries rich in biological diversity are forced to “eat” their capital, putting future options for sustainable development at risk. And given the increasing degree of interdependence among nations, this reduction of options for economic and social development will eventually have worldwide impact.

80. Global change affects all regions of the world, but the impacts on agrobiodiversity are of particular concern in two of the cradles of world agriculture: namely, Central America and the Andean region. Several sets of agrobiodiversity in these regions have supported impressive civilizations in the past, and they have provided the building blocks for food security and economic growth in other parts of the world as well. Over the last three centuries, the historical evolution of Europe and North America would have been quite different without the potato and maize, respectively. With the exception of Asiatic rice, most of the crops feeding Africa today come from Central America and the Andean region.

81. Two international treaties have highlighted the importance of conserving as much as possible of these two regions’ biological capital. Though some countries have already made important investments in conservation and are committed to doing more, there is no doubt that their conservation efforts need to be rationalized and made more profitable. Two recurrent questions from ministries of the environment are where to locate additional protected areas and for which species. There is thus an urgent need to establish a better technological basis for decision making in conservation—one that takes into account diversity for economically important plant species, and not just charismatic animal species with strong public appeal.

82. Another recurring question—one asked by both ministries of agriculture and environment—is how to reconcile the need to intensify agricultural production with that to conserve the environment. In other words, how can farmers increase their incomes, while conserving more biodiversity on their farmland and in surrounding rural habitats? Government policy makers as well as scientists are increasingly convinced that the largest share of biodiversity will be saved—or lost—outside the current protected areas, in connection with a second “green” revolution.

CIAT will pursue this issue along six main fronts:

83. The first front is conducting a threat analysis, specifically for changes in land uses, climate change, economic globalization, and urbanization. Part of that information already exists but is scattered or in such a form that policy makers and interested stake-holders cannot make use of it effectively.



84. The second front is the spatial distribution of the target species both as landraces and wild relatives. Again part of that information already exists but is spread geographically and institutionally, and another significant part is still to be gathered.

85. The third front is in improving the management of biodiversity, mostly by local communities and conservation agencies. Much additional information is needed for this purpose, but it can be assembled largely through the tasks described above and translated into suitable forms for those who play key roles in agrobiodiversity management. There is also a need to experiment with different practices for managing rural habitats, such as roadsides and fallows, to expand the existing protected areas.

86. On the fourth front CIAT will generate knowledge about functional diversity, that is, genetic diversity related to plant functions that are vital for economically important traits (eg, tolerance to drought, low phosphorus, and soil acidity) contributing to the progress of agriculture. Modern biotechnology, through the sequencing of plant genomes, is developing tools for massive screening of germplasm accessions for genes corresponding to such traits and for their variation. This has two main consequences: First, it means that information about the additional value in these accessions can be used to orient conservation efforts. And second, it creates new possibilities for gene enrichment, both in major staple crops as well as in secondary crops with high potential for income generation (such as exotic tropical fruits). Gene enrichment will contribute importantly to meeting the challenge of increased agricultural productivity with fewer inputs (water, fertilizers, pesticides, for instance).

87. The fifth front is the need to share the benefits of agrobiodiversity, with a large share of the returns going to rural communities. Rural people need to become informed stewards of agrobiodiversity and to receive economic returns for their efforts in germplasm conservation and enhancement. Agriculture has been pushed steadily into an almost purely production role, while its “environment services” role has been consistently ignored. Through the proposed use of modern biotechnology tools, it should be possible to reinforce these services and provide compensation under sustainable schemes.

88. The sixth front is a common thread throughout the five others: training, capacity building and information sharing, at the different appropriate levels: governments, professionals, NGOs, communities, farmers and other stake-holders.

#### *Learning to innovate*

89. This research line offers rural households, farmer groups, and whole communities the means to identify opportunities and learning approaches that fit their conditions. These approaches will help rural people make their agricultural production more competitive and market oriented, while managing the risks involved in technical and social change. Moreover, through creative applications of information and communication technologies (ICTs), the initiative will better enable people to discover and share the knowledge and information needed to enable rural innovation on a wider scale.

#### *Linking Farmers to Markets*

90. Farmers in developing countries must find ways to raise incomes if they are to achieve food security, meet other basic needs, and afford to protect the natural resources that benefit society at large. There is no one perfect option. Rural communities need a mix of options that enable both women and men to compete in markets, offer benefits to the community’s least fortunate members, and are friendly to the environment. To help rural people identify and pursue such options, CIAT has devised an approach whereby farmer groups, with the aid of local organizations, can develop rural agroenterprises in a given territory, such as a watershed or municipality.

#### *Opening Pathways for Communication and Information*

91. ICTs are not yet widely available to rural communities in developing countries. But privately run Internet cafes are proliferating in small towns, and growing numbers of governments and NGOs are extending Internet access to remote rural areas through socially progressive connectivity programs. Moreover, some organizations are finding innovative ways to link the use of ICTs with more conventional or traditional communications channels, such as community radio and theatre. If rural people are to make more than superficial use of those technologies and tools, local organizations must help incorporate them into a community-based process of technical and social innovation through well-focused training, orientation, and content development.

92. The approach we will follow in CIAT:

- establish community telecenters, supported by local organizations, offering public access to ICTs;
- form or strengthen groups of innovative farmers and development professionals dedicated to seeking out and sharing information that can help their communities build sustainable livelihoods; and
- construct web-based information systems that combine important knowledge from farmers’ experience with relevant information obtained from local organizations.

*How: Blending Scientific and Local Knowledge*

93. To create an entrepreneurial culture, rural communities must be able to solve problems in production and processing through local experimentation. At CIAT we know from much experience that rural people can conduct sound research, and we have devised participatory approaches that enable them to do so. A major advantage of participatory research methods is that, rather than perpetuate dependence, they provide farmers with skills needed to solve problems and seize opportunities. Participatory monitoring and evaluation help ensure that farmers own the process. Another advantage of these methods is that they encourage the fusion of formal science with insights from farmer experimentation, resulting in alternatives that are both technically sound and locally relevant.

*How: Learning Alliances and Planning for Change*

94. The various approaches CIAT is using are not fixed recipes for success. Rather, they are versatile tools for learning, which open the way to technical and social innovation. To adapt and apply these tools in diverse rural communities requires the active participation of numerous partners. For this purpose, CIAT is entering into a series of “learning alliances” with major international NGOs and other organizations.

95. A central objective of these alliances is to refine, adapt, and apply the participatory approaches described here on a large scale in Africa, Southeast Asia, and tropical America. They also provide us with new channels by which to make the improved crop varieties and knowledge resulting from our research more widely available. The learning alliances thus provide a broad framework in which we can collaborate with an expanding array of rural development actors.

*Rural Planning*

96. Another path to partnership, one that parallels the learning alliances, centers on rural planning. In recent years, CIAT has developed a systematic approach to this task that combines close consultation in local communities with the use of geographical information systems (GIS). Designed for municipal governments and other local organizations, the approach seeks to make them more responsive to rural communities and more relevant to rural innovation.

97. The first step is to form or strengthen a group of stakeholders in the development of a given rural territory, the work with the group to define a desirable future—based on community needs—using a cross-sectoral systems approach. Based on careful consideration of multiple options, and with the help of experts, the group then designs appropriate actions by which this collective vision can be made a reality. Next comes a need to determine opportunities and plans for research in support of the action plan and the identification of policy obstacles to local innovation and formulation of strategies for addressing these hurdles.

98. To sum up CIAT’s thrust to improving rural livelihoods let me try to answer in a nutshell what it is that we need to do differently to improve the lives of the poor:

99. Agricultural research for global public goods should employ empowering and participatory approaches consequent with the ideals of development. It must work with the poor to provide them tools to better solve their own problems and make their own decisions. It should tackle the issues of degradation of the resource base and work on improving the natural assets of rural communities with approaches to improving rural incomes and the capacity of rural communities to access needed and appropriate information.

CONCLUSION: SCALING UP THE DOUBLY GREEN REVOLUTION

100. In the days when combating hunger by raising agricultural productivity was the sole mission of the Future Harvest centers of the CGIAR, there was a clear strategy for spreading technical innovations. International crop breeding programs developed improved varieties of the major cereals, working in tandem with national research programs across the developing world. Together with appropriate crop management practices, these varieties were disseminated on a huge scale, particularly in more uniform and favorable environments, mainly through national agricultural extension systems.

101. This “classical” technology transfer approach gave extraordinary results, boosting food supplies, bringing down the prices of key staples, and thus generating enormous economic benefits for the developing world’s poor consumers. The so-called Green Revolution also delivered large environmental payoffs by making it less necessary to bring fragile, marginal lands into food production.

102. At the same time, though, agricultural intensification put pressure on the environment, as reflected in declining soil fertility and contamination of water supplies through excessive use of agrochemicals. Moreover, despite large gains in agricultural productivity, hunger persisted in some regions and among the producers of certain crops. Most disconcerting, rural poverty proved highly recalcitrant throughout the tropics, casting a long shadow on the great technological, economic, and social achievements of the 20th century.

103. In response to those challenges, the Future Harvest centers and many other organizations embarked in the 1990s on new initiatives aimed at achieving what agricultural scientist Gordon Conway called a “doubly green” revolution. The idea was to create new waves of economic impact that would reach into previously neglected corners of the tropics while preserving the natural resources on which rural livelihoods depend.

104. Improved crop varieties still figure importantly in these initiatives—often as the best entry-point to introduce improved management practices. Increasingly, the products of the new research for this revolution have tended to be more knowledge-intensive, consisting of participatory methods, improved practices for natural resource management, and a growing need for working in partnership and alliance with multiple institutional actors along the research to development continuum.

105. On the one hand, fairly wide use of participatory methods has resulted in the development of more appropriate technologies, which farmers have adopted more readily. But, on the other, the effectiveness of those methods is limited by the persistence of a supply-driven, “pipeline” approach to technology development and transfer. That approach was ideally suited to the Green Revolution. But if the centers are now to achieve a doubly green revolution, they must undergo a profound cultural shift toward a more demand-driven, interactive model.

106. Such a transformation will require, among other things, that the Future Harvest centers adopt new styles of working with a wide range of development partners at the community level. Only then can they translate participatory research into participatory development, generating economic and social benefits on a large scale. CIAT is heavily involved in developing these new partnerships, with the support of DFID and other donors.

107. The support of DFID to CIAT has been critically important in this continual process of growth and change to meet the new challenges facing the developing world. With a commonly accepted agenda in the Millennium Development Goals, the world is facing an extraordinary opportunity to marshal scientific knowledge and local wisdom in a concerted push to solve some of humanity’s most difficult problems. Important gains have clearly been made, but we cannot afford to be complacent as more than twenty percent of the Earth’s population is left behind while technological progress barrels forward. A renewed commitment on the part of all stakeholders interested in human development to meet these ambitious targets can guide people of good will to work diligently to address the inequities unsolved, or even created, during the past 40 years of progress.

108. On behalf of CIAT and our partner research centers, NGOs, developing government agencies, farmer organizations and smallholder farmers in the developing world, I extend my sincerest gratitude to the government of the United Kingdom for its support of international agricultural research. I wish also to thank the Science and Technology Committee of Parliament for this opportunity to provide input into these important deliberations.

*November 2003*

## APPENDIX

### SELECT EXAMPLES OF IMPACT OF DFID-FUNDED RESEARCH BY CIAT IN ALLEVIATING POVERTY AND HUNGER

#### *Promoting economic growth in small-farm communities of El Salvador through sustainable pest management*

109. During the early 1970s, the Valley of Zapotitán in El Salvador was developed into an irrigation district to provide the nearby national capital, San Salvador, with basic foodstuffs. The idea was also to create new income-earning opportunities for small farmers living in the 3,020-ha valley. About 67% of these farmers have less than two has, as is typical in Central America’s most densely populated country, where more than 80% of the scarce agricultural land is occupied by farms of less than three has.

110. With ready access to the large market in San Salvador, small farmers thus gained the additional advantage of an abundant water supply during the five dry months of the year. Not surprisingly, these farmers diversified traditional subsistence cropping (based on staples such as maize and common bean) by adopting high-value, horticultural crops, including tomato, sweet pepper, and cucumber. By 1975 more than 500 has of horticultural crops had been planted in the valley.

111. Then, between 1975 and 1985, Latin America suffered a severe economic recession, which, among other effects, resulted in substantial downsizing of national agricultural research institutions. This left most small farmers without technical assistance to manage the many disease and pest problems associated with horticultural crops. Consequently, these growers resorted to indiscriminate use of pesticides, which agrochemical companies marketed aggressively as the only alternative for protecting farmers’ investments and livelihoods.

112. Despite widespread pesticide use, whiteflies and whitefly-transmitted viruses caused major production losses. This eventually led to a drastic reduction in the total area planted to common bean and horticultural crops—from 1,350 has in the early 1980s to less than 78 has in 1999. Crops such as common bean, tomato, and pepper practically disappeared from the Zapotitán Valley during the dry months of the year (December-May), when whitefly populations reach a peak.

113. Since market prices are highest in the dry season (eg, tomato prices average US\$7.25 per 22-kg box in the rainy season, compared to \$23.50/box at the end of the dry season), the virtual elimination of production during this period caused a drastic decline in household income. Traditional crops, such as maize, provide no more than \$100/month on a small farm of about two has, whereas the same area planted to both staple and horticultural crops can produce a monthly income of \$1,000.

114. To help overcome the problem, DFID's Crop Protection Programme funded a pilot project in El Salvador, aimed at recovering dry-season production of common bean and various horticultural crops in the Valley of Zapotitán. The project was fully supported by El Salvador's National Center for Agricultural Technology (CENTA), which has assigned top priority to the recuperation of San Salvador's "granary" in its agricultural research agenda. This pilot project is also part of a larger initiative of the Global Whitefly Integrated Pest Management (IPM) Project, which is coordinated by CIAT, and funded in its current, second phase by DFID.

115. One of the first IPM measures implemented was the use of new bean genotypes possessing resistance to whitefly-transmitted viruses as well as the red seed color demanded in the San Salvador market. The line selected, EAP-9510-77, was developed by the Pan-American School of Agriculture in Honduras from various sources of resistance identified by CIAT and national programs in the region. Replicated trials in Zapotitán were planted at the beginning of the dry season under high whitefly/virus pressure. The local red-seeded bean cultivar "Rojo de Seda" served as the control, and all trials received only one insecticide application, compared with 15–30 applications typically applied by local bean farmers. The trials were observed throughout the growing season by farmer groups organized by the CENTA Extension Agency of Zapotitán. While "Rojo de Seda" yielded less than 100 kg/ha, on average, the EAP line yielded over 800 kg of good quality seed.

116. In the case of tomatoes, the main IPM measure consisted of using "microtunnels" made of anti-whitefly mesh to protect seedlings and young plants up to 30 and 60 days after transplanting. The control consisted of the same tomato variety planted in the traditional open-field manner. These unprotected plots were totally destroyed by whiteflies and viruses. The protected plots, in contrast, produced 12.8 MT/ha for the 30-day protection treatment and over 60 MT/ha for the 60-day treatment (the national average is 20 MT/ha). Both trials were carried out with only one application of a systemic pesticide at sowing and one additional application at transplanting, compared with more than 50 applications usually applied to tomato crops in a single growing cycle. Discounting the cost of the protective mesh, the profit per hectare exceeded \$10,000.

117. These preliminary results show that the livelihoods of small-scale farming communities can be greatly improved by providing proper technical assistance in crop protection. Mixed cropping systems provide small farmers with food security and opportunities for increasing incomes. Farmers often grow other crops, such as maize, which are not damaged by whiteflies, as an additional risk-aversion strategy. The national program is now planning to transfer these simple technologies to other agricultural regions of El Salvador.

#### *Bean improvement for the tropics*

118. The common bean is the most important grain legume for direct human consumption in the world, and is an important source of cheap protein, minerals and carbohydrates. Total world production exceeds 12 million MT, of which 7 million MT are produced in Africa and Latin America. In Africa much bean production is in hands of women producers, with limited or no access to purchased inputs such as chemical fertilizers or pesticides. Bean production in both continents often occurs on small farms with sloping, infertile land. Beans and other legumes enhance soil fertility through nitrogen fixation and by solubilizing unavailable soil phosphorus.

119. Beans usually enjoy a two to four-fold price differential over maize (its most frequent cereal companion) and are important sources of income. Central American farmers state that beans are their number one income earner among widely grown staples. Beans contribute to inter-seasonal food security, lower migration rates, and enhanced nutrition status of women and children—an important target of the Millennium Development Goals.

120. National or regional yield averages for beans are normally in the range of 500–800 kg/ha, well below the crop's potential of 2.5–3 MT/ha. In Latin America yields are barely competitive in a world market, whereas in Africa production struggles to keep pace with population growth in spite of successes. Raising bean yields is an urgent need to assure food security and to address hidden hunger due to deficiencies of iron and other minerals. Low soil fertility, droughts, diseases and pests contribute to this yield gap, and can be narrowed substantially by a combination of new cultivars and conservation agriculture techniques.

121. Some 300 million people worldwide depend on beans as their primary food legume. Consumption is highest in rural areas of East-Central Africa, especially Rwanda, Burundi, eastern Congo, Uganda and western Kenya, where it can exceed 50 kg per capita per year. Malawi is the most important bean producer and consumer in southern Africa. National figures in Central America and Brazil suggest consumption

levels of 12–18 kg/year, but local studies in rural areas reveal as much as twice this level. Throughout all these regions it is the poor who produce and consume most of the beans, as a cheap source of protein and other nutrients.

122. By 2003 national programs had released a total of 475 CIAT-related varieties, including 319 in 17 countries of Latin America and 156 in 14 African countries. These varieties are planted on an estimated total area of nearly 2.4 million hectares and have generated cumulative benefits of almost \$1.3 billion in 1990 US dollars.

123. In Central America about 40% of the bean area is planted to improved varieties that are estimated to increase yields by an average of 268 kg/ha. In the Andean zone, between 1994 and 1996 alone, all countries enjoyed sharp increases in bean production thanks to improved varieties, with yield increases ranging from 8.7% in Colombia to 16.9% in Bolivia. Improved varieties occupied 70–80% of the total bush bean area in Ecuador, about 60–80% in Peru, and about 95% in the eastern plains of Bolivia. As 34% of bean production (9,000 tons) is used for domestic consumption, food security has been significantly enhanced by these yield increases.

124. In Africa improved climbing beans introduced by CIAT are creating a production revolution. In 1993 a nationwide survey in Rwanda found that the new beans had been adopted by half of Rwandan farmers. The climbing bean varieties have spread from Rwanda through regional networks to Burundi, Congo (formerly Zaire), Ethiopia, Kenya, Tanzania, Uganda, and Zambia.

125. In western Kenya, with population density of 400–900 persons/km<sup>2</sup>, the development and dissemination of root rot resistant varieties has led to adoption rates of 80%. Farmers have enthusiastically adopted several new varieties of beans that resist root rots, a devastating disease that forced some farmers out of bean production in the 1990s. A recent impact study showed that one of the adopted variety, KK 15 was being grown by 80% of farmers. Adoption of the new bush bean variety improved household food security and increased cash incomes. Farmers reported using this cash to pay for immediate household and health needs, such as food, fuel, soap, and medicine, as well as for longer term investments, mostly school fees, books, clothing, livestock, seed and fertilizer.

126. Participatory research approaches have been used to diffuse integrated pest management technologies among farmers beset with the Bean Stem Maggot and Bean Leaf Beetle, the number one pest of beans in East Africa. Hundreds of farmers participated in farmer schools in Tanzania to learn practical methods of pest control that are within their reach.

127. Simple adoption must also translate into impact. In a study in Nicaragua, farmers using an improved variety earned greater profits than those using a traditional landrace (US\$390 per hectare versus \$136), as a result of higher bean yields. Even if bean prices had been 40% lower, production would still be profitable with the high-yielding improved variety.

128. Bean production in Bolivia has had important social consequences. Previously, a lack of options during the winter season had forced farmers to work as migrant laborers. But now many of them stay home to produce beans for export, mainly to Brazil, Colombia, and Japan, earning some \$3 million annually. Farmers attribute increased well-being of their families, such as increased educational opportunities of their children, to bean production.

129. Climbing beans in Africa are probably the most dramatic success story of the bean project, precisely in an area where the resource base is most fragile, and opportunities for impact are scarce. By 1993 climbing beans had raised production by 66,000 tons a year, generating extra income of about US\$15 million.

130. Increased yields from root-rot management in Kenya reduced bean shortages, and improved food security and welfare. Farmers have used income gains from the new varieties for both short-term consumption and productive investments especially on food, household items and school related expenses. Similarly, in Uganda bean varieties financed home improvements and education for farmers' children. An impact of two improved bush bean varieties (K 131 and K 132) in Uganda showed increased production by as much as 6,303 tons valued at US\$1,891,000. Proceeds from increased productivity have financed home improvements, education for farmers' children, purchase of cattle and other household needs.

131. Homestead improvements after selling beans of an improved variety K 132 in Uganda. Farmers are able to make significant improvements to their homesteads.

132. The success of bean research has led ASARECA, the Association for Agricultural Research in East and Central Africa, to place high priority on beans as the second most important crop, after maize. In particular, climbing beans have received endorsement from ASARECA as an area deserving of continued support.

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*Linking farmers to markets—rural agroenterprise development*

133. Today's global economy presents rural people with both threats and opportunities. Many small farmers in the tropics can no longer profitably produce traditional staples. But at the same time, rising demand at home and abroad for a wide variety of tropical products is creating new options for them to achieve better livelihoods. The challenge is to help these farmers connect with growth markets by adding value to traditional crops (such as cassava and beans) and by diversifying into new enterprises, based on sound analysis and development of the best opportunities.

134. The risks of agricultural entrepreneurship are accentuated by persistent production-side bottlenecks: tight credit, high input costs and weak business support services. And on the distribution and consumption side, constant threats to small business viability include poor roads and transport, lack of timely market information and unfavorable international trading regimes.

135. Demand for CIAT's agroenterprise research findings has led to multi partner learning alliances with development partners such as FOODNET, AFRICARE, Catholic Relief Services, GTZ, CARE and Swiss Contact in nine countries in Eastern and Southern Africa and eight countries in the Americas. Through these alliances, CIAT's findings are tested, adapted and used by partner organisations to contribute to improved livelihoods for more than 100,000 poor rural families in Africa and Latin America.

136. The project primarily serves small and medium-scale farmers having only limited access to land, capital, and information. By generating employment in rural areas, its work also creates opportunities for the poorest rural people, mainly landless farmers and laborers. According to participatory poverty assessments conducted at our reference site in Honduras, women head one-third of the households in these two target groups. CIAT research benefits these groups directly in reference sites through action research processes that reach approximately 2,400 families in Africa, Asia and Latin America. By adding value to development initiatives through learning alliances, research findings strengthen development agencies that reach significantly larger populations. Additionally, the Rural Agroenterprise Project conducts regular regional training courses in Africa, Asia and Latin America and maintains one of CIAT's most popular websites with an average of 6,800 monthly visitors.

137. The Rural Agroenterprise Project uses four methods for uptake promotion: fieldwork in reference sites or with farmer organisations; learning alliances with development agencies; training; and, the web site. In the case of fieldwork, the relationship between CIAT and poor groups is direct with CIAT scientists spending substantial time interacting with the rural poor and their organisations. In learning alliances, CIAT interacts with major NGOs and their local partners active in rural enterprise development in a range of activities including method design, training, backstopping, documentation and learning with the goal of strengthening capacities and increasing development impact. In addition, research results are disseminated to diverse users via training and maintenance of the project's web site.

138. CIAT's Agroenterprises Project carries out action research in partnership with local government organisations, NGOs, producer associations and the private sector. A key first step is to form rural agroenterprise committees to foster collective, coordinated action. The committees develop a strategic plan for agroenterprise development, including a portfolio of high-potential products. For each product, strategies for value chain development are designed and implemented with a range of market actors. Around each value chain, relevant business development services are identified, strengthened or created and a market for them facilitated. The sum of this work is a set of interconnected methods that provides a clear set of strategies for income and livelihood diversification for rural communities and their support agencies. In the last three years, CIAT scientists have applied this framework to support and promote diverse kinds of agroenterprises in rural communities in Eastern Africa and Latin America. As of 2003, a new project will complement this work in Southeast Asia.

139. In all of the reference sites, rural agroenterprise committees have been formed, and they have developed strategic plans, with portfolios of high-priority products. In Lushoto District (Northern Tanzania), for example, a group of farmers met with successful producers in a neighbouring community to learn about quality requirements for farm products, frequency, volume of delivery and prices. The Lushoto farmers learned that fellow producers 20 kilometers away had organised themselves, introduced new production technologies and captured a share of the high-value fruit and vegetable market in Dar es Salaam. As a result the Lushoto farmers have formed an association to handle their future marketing activities. Elsewhere in Africa, farmers in southern Malawi are experimenting with production and marketing of goats and rabbits, and in southwestern Uganda with farm fresh eggs for local sale and pyrethrum flowers for sale to an organic pesticide plant in Rwanda. While these enterprises are new for farmers, Jeffrey Habarwasha, chair of the Muguli (Uganda) income generation committee notes, "We know that development and income generation are processes that don't happen overnight. Despite the hardships and risks, we're ready to forge ahead and make a go of it."

140. In the municipality of Yorito (Honduras), CIAT methods contributed to the design and implementation of strategies for a high-quality coffee value chain leading to the establishment of a farmer cooperative, organic certification and a sale price 50% higher than non-participants. This year, two of the participating farmers were included among the 20 best quality organic coffees in Honduras. In Pucallpa (Peru), similar methods allowed small black pepper producers to differentiate their product and demand prices 20% higher than normal as well as negotiate favourable long-term agreements with industrial buyers.

141. With a view to extending this development process beyond the reference sites, CIAT's Agroenterprises project has entered into learning alliances to support development partners and their projects in 17 countries, provided on-going backstopping to reference site partners, run two regional training courses in Asia and various short-term seminars in Latin America.

142. Rural agroenterprise research has short, mid and long-term livelihood implications for the rural poor. In the short term, CIAT work has resulted in an average income increase of 20% across a range of agricultural products in Latin America for smallholders. In the mid-term, participating producer groups move into more complex marketing strategies to differentiate their products and develop more stable relations with other market actors leading to additional income increases, rural employment for non-farmers and more stable income patterns. Long-term projections include strategies linking improved production techniques, post harvest activities, new product development and value chain development and management to differentiated, value added products that compete successfully in regional, national and international markets. The establishment of learning alliances between CIAT and major development actors seeks to facilitate similar results across a far wider range of rural communities in Africa, Asia and Latin America.

143. Specific project results have influenced local development organisations while the sum of our work—expressed as the “territorial orientation for rural agroenterprise development”—has been picked up and applied by major international development NGOs as part of the learning alliance process in Africa and Latin America. New projects in Asia and Central America seek to construct links with government agencies and major donors, respectively, regarding the implications of agroenterprise development for sustainable rural livelihoods and as such represent a new area of work for the project.

*Strategic use of multipurpose forage germplasm by smallholders in production systems in hillsides of Central America*

144. The fragile hillside environments of Honduras and Nicaragua represent 80% of the surface area of Central America and are home to many poor people—both livestock and non-livestock keepers—in the rural sector. Honduras and Nicaragua are among the countries in Latin America and the Caribbean with the highest poverty.

145. Mesoamerica is a net importer of dairy products, and the demand is growing faster than productivity increases. Data indicate a current annual productivity increase of 4.6% while imports of dairy products increase 13% annually. Smallholder dual-purpose cattle farms, providing currently more than 75% of regional dairy production, have satisfied most of the demand for dairy products in the region. In addition to a large national demand for dairy products in Honduras and Nicaragua, neighbouring countries are also increasing their consumption and imports and positive trade agreements exist with Mexico and Canada. The recent FDA approval of cheese export from Honduras to the USA indicates another market opportunity with a favourable price structure linked to the growing Latino community in the USA. There are a number of large dairy processing plants in the region complemented by many small rural artisanal cheese factories, making the livestock sector highly linked to markets and one with a high demand for improved livestock/forage technologies.

146. Although national research systems have severely weakened over the last decade in Nicaragua and Honduras, CIAT and its partners have created a good enabling environment for reaching a large proportion of poor livestock keepers through both public and private sector infrastructure such as NGOs and development projects operating in the region as well as local farmer-to-farmer networks and farmer research committees. In addition, CIAT works closely with private forage seed enterprises in the region (eg, Papatla in Mexico and Tempate in Costa Rica), which have established their own regional networks. Suitable forage technologies offer these farmers opportunities for income generation while protecting the natural resource base.

147. Farmers in reference sites of the project in Honduras and Nicaragua identified drought-tolerant grass and legume (herbaceous and woody) species with potential to improve livestock production and recover degraded pastures and thus reduce pressure on land not suited for livestock. It is anticipated, as shown by one pioneer farmer in Honduras, that adoption of improved forages will quickly realise greater earnings, increase herd size on less land, use labour more efficiently, and allow reforestation of steep lands. The availability of improved forages has led to the development of farmer-led seed delivery systems which are key to ensure diffusion and adoption of improved forages. Tools being developed by the project will facilitate targeting forages to diverse biophysical and socio-economic niches in and outside the reference sites. Additional beneficial effects on rural employment are expected. Spillover effects to countries with similar environments and large numbers of poor people (ie Haiti and Mexico) could potentially reach 15 million producers.

148. It is estimated that the project has reached approximately 1,500 farmers, of which 300 to 400 are adopting improved forage-based technologies. In the reference site in Honduras where the pilot work started in 1999, about 30% of livestock keepers have adopted improved forages. The project is in the process of scaling to other regions outside the reference sites in Honduras and Nicaragua.

149. One farmer-led forage seed enterprise has been formed in Honduras, while other seed enterprises in Honduras and Nicaragua are emerging, facilitating further scaling and at the same time offering direct income to seed producers, principally small-scale farmers. Resources supporting the creation of such enterprises are minimal as the initiative is coming from farmers. The expansion of the concept is easily feasible and sustainable as long as a market demand exists. Potential for income generation of farmer-led forage seed enterprises is high. Though the initial investment (US\$430/ha) is relatively high, the potential net return (US\$880/ha) is also high as compared with a return for maize (US\$87/ha). Current demand for seed of improved forages is far greater than supply and large-scale seed enterprises are interested in buying seed from the farmer led enterprises. While in 2002–03 farmers have produced about 400 kg of forage seed, for 2003–04 farmers are doubling the area for seed production, which will allow to plant over 500 ha of improved forages and there are discussions to subcontract more farmers. Thus, demand is clearly rising.

150. Finally, one important outcome of the project is the example given by one pioneer farmer in Honduras who adopted improved forages. This farmer increased family income from the additional milk resulting from planting drought tolerant grasses and legumes. The use of improved forages and feeding systems also allowed the farmer to revert steeply sloped pastures back to forest and protect an important local water source. The essence of the project is to expand these positive results to many other farm families in Central America and beyond.

151. It is anticipated that the main impact of the project will be on income generation and improved management of natural resources. Small hillside farmers who adopt improved forages will be able to realise greater earnings, increase herd size on less land, use scarce labour more efficiently, and reforest their steep lands. Increased incomes and employment are also expected from diversification into perennial-based local agro-industries.

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## APPENDIX 47

### Memorandum from Hubert Zandstra, Director General, International Potato Center

#### GENERAL COMMENT

Achieving the Millennium Development goals through science and technology development underlies CIP strategy formulation and vision for the future. We have used poverty impact mapping to identify the intervention points and beneficiary targets for our newly redefined research program. Science and technology continue to play a crucial role in development. Agricultural science and technology are especially important to developing world countries as over 70% of their poorest citizens live in rural areas and depend upon subsistence farming to survive. The outstanding impact and high returns to investment achieved by the Consultative Group for International Agricultural Research (CGIAR) has been well documented. In the case of CIP let me share with you two recent examples of the high impact agricultural research can have on the developing world:

CIP in cooperation with Sainsbury Laboratories and the Scottish Crop Research Institute developed diagnostic techniques to control sweetpotato virus in China. The techniques for virus detection and tissue culture based distribution of virus free planting material have been widely adopted. In 1998, the benefits from 500,000 ha of sweetpotato crop in Shandong alone were estimated at £99 million/year, and production increased by 22% in the province. This technology has been spread to other regions in China, and it is estimated that nearly one million ha have benefited from the improved techniques in Shandong and neighbouring provinces.

Vitamin A for Africa (VITAA), an award winning program that introduces orange-fleshed sweetpotato into Sub-Saharan African countries to combat Vitamin A deficiency, was supported in part by DFID sweetpotato research. NRI International participated with VITAA, conducting the early analysis of sweetpotato production and utilisation systems, and the more upstream work on integrated pest management (IPM), as well as virus resistance research. The VITAA partnership currently includes 44 local and international NGOs, National Agricultural and Nutrition Institutes. Thousands of small farm holders are adopting the new varieties, and orange-fleshed sweetpotato has entered the food system at the village and urban level. The program aims to reach three million severely affected Vitamin A deficient children in the region and to reduce overall infant mortality among children under six by over 25%.

1. *The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

DFID has been very influential in supporting the work of International Agricultural Research Centres of the CGIAR on sustainable livelihood issues. The expertise of British international staff has been crucial in the implementation of projects that advance scientific capacity in developing countries.



The DFID supported project “Integrated management of bacterial wilt and soil-borne diseases of potato in farmer communities of inter-Andean valleys of Peru and Bolivia” has taken the fight against potato late blight (*Ralstonia solanacearum*) to the policy level. In 1997, CIP pathologists improved upon an existing diagnostic technique that greatly increased their ability to detect latent infection of potato late blight, a condition difficult to detect because the plants show no visible symptoms of the fungus in the field. This CIP project is currently lobbying with the National Service for Agricultural Food Quality (SENASA) of Peru to pass a Supreme Decree that will include testing for latent late blight infection in all Peruvian potato seed certification, in order to better prevent the spread of late blight to uninfected areas. CIP and SENASA are currently training local personnel in the use and application of this technology.

CIP has also developed trade-off analytical tools that help decision-makers in developing countries quantify the relationship between key economic and environmental indicators, and their health impact. In addition, CIP has worked on techniques to improve local decision-making on cross-sectional concerns such as land use and access to water. CD-ROMs, internet-based simulations, training, and virtual reality are used to bridge the existing gap between scientists and the general public.

The Consortium on Sustainable Development on the Andean Eco-region (CONDESAN), convened by CIP, lobbies local and national governments to alter their policies on mountain areas to create jobs, to increase incomes, to protect the environment, and to stimulate economic development in these regions. Examples of this support are:

1. In 1998, CONDESAN organised the e-conference “Rural Municipalities and local participatory management in mountain regions” for The Sustainable Agriculture and Natural Resource Management (SANREM-Andes) project and the Ministry of Social Welfare in Ecuador.
2. During the International Year of the Mountains, CONDESAN facilitated various awareness campaigns that targeted a broad audience of policy-makers, governments and other stakeholders.
3. This year, the work of CONDESAN has led to improved water policy legislation in Bolivia. To facilitate consensus among key stakeholders, CONDESAN organised an e-forum: “La concertacin: instrumento para la gestin de agua dulce en el siglo XXI” (Consensus: an instrument for fresh water management in the XXI century). This participative process is currently being used as an example in other Andean countries seeking to change their current water policy.

*2. The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

DFID called on CIP to assist with the integration of the work DFID supports in Bolivia leading to the project “Strengthening technical innovation systems in potato-based agriculture in Bolivia” (INNOVA) coordinated by CIP/PapaAndina. INNOVA delivers scientific information directly to national governmental actors to strengthen their capacity and guide their policy into better delivering pro-poor outputs. The potato is a tremendously important crop to the Bolivian national market, as well as to the country’s food security, yet the Government of Bolivia does not include the potato as a priority crop in its current strategy. With DFID support the INNOVA project initiated a study that analysed the competitiveness of the potato market and the principle restrictions on the potato industry in Bolivia. This study identified the factors that favour and/or affect the competitiveness of the potato sub-sector, the existing relationships between different actors in the potato market, and current competitive strategies, in order to develop a plan to increase the competitiveness of the sub-sector. The Bolivian Ministry of Agriculture reacted very favourably to the conclusions of the study: that the potato should be included as a priority crop in the Bolivian national agricultural development program Sistema Agropecuario de Tecnologia Agropecuaria (SIBTA), as well as in the Bolivian System for Productivity and Competitiveness. INNOVA additionally works to develop better methodologies for identifying the demand of rural communities and to strengthen the capabilities of poor communities to make demands on research development and technology transfer systems to improve the effectiveness of the Bolivian national development programmes.

*3. The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes*

In this area the UK has an advantage over other providers of ODA funding and services, because of its outstanding education system and strong university research base. Many scientists from CIP and from cooperating National Systems have received postgraduate training in Britain. Every year we approach the British Council to study ways in which we can develop graduate training links with UK universities, now well known to us. This leads to cooperative research (such as the potato virus PVY and PVX cloning) and allows us to identify specialist sources to assist us in our research programs. The latter has been the case with DFID supported research on sweetpotato virus disease (SPVD) in Uganda, and IPM approaches in Latin America.

Capacity building in National Agricultural Research Institutions (NARIs) is a long-term investment with high returns. It allows these institutions to become effective partners in an international framework of research and technology exchange leading to high productivity increases in the key economic sectors of developing countries. Areas such as germplasm management and biodiversity maintenance, phytosanitary services for plant introduction and export support, and public/private sector development of market chains that will create new products and generate employment, are all areas requiring attention.

*4. The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries*

CIP and its partners have long been beneficiaries of the scientific training provided by British institutions. British organisations also provide their expertise through scientific partnership programmes convened by CIP.

CIP currently employs four British scientists as permanent staff, and has trained representatives from over 28 British universities on issues of developing world agriculture through symposiums, conferences, and workshops. CIP maintains a relationship of open exchange with many British scientific institutions, and has provided potato germplasm to 13 British scientific partners.

Our British staff currently focuses their scientific efforts on the issues of Integrated Pest Management, as well as on Urban Agriculture. Our British staff members' work on Integrated Pest management studies the effects of developing world pesticide use on farmers, the environment, and consumers, and looks to develop and disseminate alternative methods for pest control. Their policy efforts have included farmer field schools dedicated to educating farmers on the dangers of toxic pesticides, as well as stakeholder policy meetings, that include governmental ministries and local political leaders, to call for the prohibition of toxic pesticides and the support of policies that favour alternative technologies.

Our British staff members' work on urban and peri-urban agriculture seeks to contribute to the food security of poor urban families, and to increase the value of agricultural production in urban and peri-urban areas, while ensuring the sustainable management of the urban environment. Their work with local municipal authorities supports urban agriculture and uses advanced technology such as Geographic Information Systems (GIS) to encourage better urban planning.

*November 2003*

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## APPENDIX 48

### **Memorandum from Professor David W Taylor, Centre for Tropical Veterinary Medicine**

I have been directly involved in tropical human and animal health research since completing my PhD in 1977. I have worked primarily in Kenya and Sierra Leone and but also have experience of developing countries in the East and Latin America.

My current research is concerned with development of a vaccine against human river blindness, work that involves field studies (epidemiology and human immunology) and laboratory studies (work with animal models and biotechnology).

My comments are primarily restricted to human health and veterinary medicine but touch upon international agriculture research as well.

1. The UK has a unique human recourse of expertise and experience in development-related research and in particular in the area of tropical medicine and tropical veterinary medicine. Major research groups active in these areas are to be found in the Universities of Cambridge, Glasgow, Oxford and Imperial College and in the Tropical Medicine Schools of Liverpool and London and the Centre for Tropical Veterinary Medicine, Edinburgh. These various groups span the spectrum of activities from field studies directly involving patients or livestock to the most advanced biotechnology and genomic research. Most of these groups and individuals are involved in collaborative research within the UK, within Europe and with developing countries.

2. The research undertaken is demand-led in that it involved disease problems identified as priorities by the World health organisation (WHO), the Food and Agriculture organisation (FAO) and the Office International des Epizooties (OIE). These priorities are also shared with relevant UK agencies and the European Union either because of strategic public health concerns or associations with food safety, food security and trade. Existing and newly emerging disease problems are being investigated.

3. UK scientists have been very successful in establishing contact with those communities that are at risk from human and veterinary disease problems and engaging these communities in the research itself. Indeed, the epidemiological and immunological studies that underpin the high tech laboratory investigations can not beginning nor be successful with active participation of the communities at risk (stakeholders) whether the investigation involves a human disease or a veterinary infection.

4. Demand-led research and stakeholder involvement has been the norm for UK tropical medicine and animal health research long before these criteria were highlighted by development agencies. However, what investigators have failed to do well is to formalise and publicise these activities in a way that is easily recognised and consequently the research community has been wrongly criticised as being remote from real problems.

5. The quality and cost effectiveness of UK science is recognised worldwide and the review by Lord may during his tenure as the Government's Chief Scientists should be consulted on these points. The recognised critical factor for maintenance of effectiveness and competitiveness is peer-review. In any future organisation of UK science for development, peer review should be central to planning and decision making once priorities are identified.

6. Despite the available human resources to tackle development related human and animal health problems there has been a decline in research effort (except HIV/AIDS and malaria) over the last few years. Probably the most important reason for this has been the significant decline in funding in this sector that is concomitant with increases in the cost of biological research. Another contributory factor is the increased complexity of grant applications relating to development that ask scientists to justify their research not only on scientific terms but also on the basis of demand and economic and social impact despite the fact that the funding agencies have already prioritised the research agenda. This is unnecessary duplication.

7. The combined effect of these factors is to deter the very best and, most important, younger (next generation) investigators from applying for funds to carry out development related research in favour of problems funded by agencies such as the Medical Research Council or the Wellcome Trust. These agencies have well defined objectives that do not change every other year and have relatively simple application procedures. Proposals are reviewed on the basis of quality of science and provide more realistic funding to achieve intermediate results and objectives in a realistic time frame. There is an urgent need to increase available funding for development-related biological problems and to establish a more streamlined and transparent way to administering such funds. These funds should be directly accessible to the entire UK scientific community through competitive grant schemes.

8. Many of the best researchers are also deterred from engagement with the development sector because they perceive, rightly or wrongly, that development administrators lack an understanding of the complexity of biological systems and scientific method. The perception that individuals with no appropriate training or understanding of science may make final decisions on funding of a science-based application has the effect of reducing the value of work supported by such a system. It is important that research for development is considered in the same regard as that carried out for, say, the Wellcome Trust and not a second-class activity.

9. How may these various issues be reconciled? One possibility may be to reintroduce in revised form a system previously employed by the then Overseas Development Administration (ODA) to support tropical medicine research. A Tropical Medicine Research Board (TMRB) was established by the MRC to administer ODA funds. This Board was made up of medics and scientists to ensure relevance and quality of science and a representative from ODA to ensure compliance with policy. This system had credibility with the scientists and the Government could be confident that it was buying the best product to achieve its goals. David Nabarro could be asked to comment more on working of the TMRB. One could envisage a revamped TMRB to manage DFID fund to support tropical (international) health research and a similar Agricultural and Animal Health Research Board within the Biotechnology and Biological Science Research Board (BBSRC) or Wellcome Trust.

10. Such independent research boards could also help to resolve another major problem facing research for development and that is short term vision. Development agencies are increasingly demanding a solution to biological problems within one or two years. This may be achievable in some rare situations but is not the norm. The quick-fix and short term vision is undermining and distorting the contribution science can make towards development. It also deters our best investigators from becoming engaged in the sector and arguably more worrying encourages the second rank to promise products can not be delivered.

11. Also required is recognition that the biological problems that face any community in any circumstances are unique and will require unique solutions. The idea that the West has solutions simply waiting to be taken on the shelf and adapted to local needs in developing countries is also wrong. While modification or adaptation of existing may sometimes prove helpful they are frequently represent a makeover. Simply changing rooms rarely provides a lasting solution. Such an approach may also be interpreted as selling second-class science to developing nations rather than the first quality science that we expect and demand in the UK. First class science is expensive and can take many years to deliver a product to the end users. Development agencies must appreciate this and be prepared to support the long term view if ultimately we are to give developing nations the correct and best solutions to their biological problems. It would be very useful if those deciding on the future support for research for development consult with the major pharmaceutical companies regarding the level of financial investment and time required to bring a new product to the market place. More realistic funding and time lines must be accepted by development agencies.

12. Africa requires special help in science and technology. The need for unique, home-grown, solutions to biological problems through generation and utilisation of new knowledge is recognised by the New Programme for Africa's Development (NEPAD). For this purpose, NEPAD is proposing to establish a series of regional facilities that will provide African scientists with state-of-the-art laboratories and equipment to utilise appropriate biotechnologies for local problems and attract more collaboration with Western scientists, including those from the UK.

13. This scheme does not envisage building new laboratories but rather a network of existing facilities linked by common research agendas based on agreed priorities. Crucial to the success of such ventures will require good communications (and in particular fast internet access), new equipment and funding that is channelled through regional agencies. The Biosciences East Africa initiative chaired by Dr Romano Kiomi, Director of the Kenyan Agricultural Research Institute (KARI) is one model of a regional implementing organisation that is at a very early stage of development. However, it has much welcomed innovations that include generation of knowledge within the region to resolve local problems and independence from funding and political agencies. Indeed for credibility at all levels it is essential that there is absolute independence from the agencies (eg the Association for Agricultural Research in east and central Africa, ASARECA) that determine research priorities and may ultimately control funds.

14. The evolution of regional centres providing state-of-art facilities and equipment for regional scientists with direct collaborations with Western scientists has the promise of more relevant research led by the communities that demand the work to be done. They will also build regional capacity.

15. Capacity building must also include support for research training through MSc and PhD studies. Since the British Council reduced its support for these activities, Africa in particular has seen a decline in its human resource in science and technology. There is need to restore funding for these purposes that would include in addition to the transition system of sending students to the UK but to develop distance and e-learning programmes. The importance of training young persons can never be overstated.

16. Use of regional forums and national governments as instruments for the disposal of research funds including those to train young investigators should help achieve greater focus on priority problems and reduce transactions costs. These agencies would provide a meeting point for development agencies and science based organisations from the region and the West for the purpose of development and funding of a common agreed regional research agenda. Such a system has the potential to reduce transaction costs by directly linking Western science to the end-users through the most appropriate authorities.

17. By advocating greater investment in regional and national biological agencies it is appreciated that funding may be reduced or removed from existing activities. In the agricultural sector the Consultative Group for International Agricultural Research (CGIAR) stands out as a major user of public funds, including those from the UK that may be considered better channelled through regional and national agencies.

18. The CGIAR institutes were established over 30 years ago at a time when there were no comparable facilities in the developing world. This is not the situation today and many developing nations (India and the Philippines are good examples) have facilities comparable and even better than those of the CGIAR. Moreover national and regional agencies are more accountable to the communities they serve and indeed to their donors. Outputs from national and regional laboratories are also often more acceptable to the end-users than those coming from the international institutes (eg the case of GM rice produced by the Philippines versus that developed in the International Rice Institute).

19. Nor can the CGIAR claim to be at the cutting edge of all the science that it is undertaking. As in all agencies there are stars but many CGIAR programmes exist only because of support provided by scientists in the West including the UK.

20. What explains the decline in the effectiveness and competitiveness of CGIAR research? Two prime problems can be identified. First, because the CGIAR historically relied on core funding (although this situation is rapidly changing), scientists in the systems have not been required to enter the competitive grant funding systems. The expectation that funds will always become available from the international community has led to complacency and poor performance compared with their colleagues in the Western scientific systems. Second, there appears to be a general reluctance on the part of the CGIAR to use peer-review to judge scientific outputs and monitor performance of individuals, groups and institutions. Rather than publication in the grey literature, which is that is not normally peer-reviewed, is often, too often, considered the most appropriate way of disseminating results. Moreover, such information is difficult to access and is frequently lost to the wider scientific and lay audiences. If work is not published in the primary peer-reviewed

scientific journals it may not as well have been done, even if the money is spent. This is an unacceptable situation. The CGIAR's belated move towards the competitive grants market because of reduction of core funding may redress the situation but is unlikely to bring the CGIAR up to the standards we find in UK and USA laboratories in the near future.

21. The CGIAR is also expensive to run. Its transaction costs are much higher than UK institutions and these are raised further when the cost of its scientific oversight committee is included. It has a top heavy management structure that is not appropriate to today's scientific institutions. This management is frequently not science led and consequently opportunities to bring the most modern and appropriate methodologies to bear on regional problems are being missed. Indeed, the whole concept of global science requires re-evaluation given the regional and ecological basis of most biological problems. In this context, NEPAD's vision for the future of biological research in Africa seems most appropriate.

22. There is a further need for the CGIAR to become more accountable to all stakeholders, both up-stream and down-stream.

23. While it is accepted that a review of the value of the CGIAR today is outwith the remit of the current consultation it must be argued that the UK's investment in the CGIAR would be better spent on: (a) reinforcing direct support for UK scientists through competitive grant schemes; (b) support regional and national agencies in developing countries including MSc and PhD training; and (c) to continue and expand the support for the special collaborative programmes of the European Union including the International Co-operation with Developing Countries (INCO-DC) programme of DG Research.

24. The INCO-DC programme of the EU (and its predecessors, Science and Technology for Development (STD 1-4) represents one of the most cost-effective collaborative programmes for tropical medicine and agriculture so far devised. The requirement for active participation of laboratories from different member states of the Union together with institutions in developing countries has fostered scientific exchange and built capacity in developing nations. There now exists across the developing world an informal network of scientists of several generations that identify the INCO-DC/STD programmes as prime movers in building national and regional capacity as well as establishing their own careers at an international level.

25. Unfortunately, the impact of the INCO-DC/STD programmes has frequently not been appreciated because the programmes have not always publicised their achievements in a way seen by other agencies such as WHO. Nevertheless, the quality and relevance of the many research outputs can be clearly demonstrated in a wide range of disciplines involving both basic and adaptive science. Two factors underlie this success. First, the programmes were and remain demand-led. Second, peer-review and quality of science are regarded as the first criteria for funding. The UK's contribution to these programmes must be regarded as one of the nation's best investments and continued and increased support is easily justified by social and scientific impact.

26. One particularly important point to make and that is while the research is targeted at the problems of developing nations, the mixture of basic and applied research has led to some very important spin-offs for the UK. For example, a study of the immunology of protective immunity against schistosomes (bilharzias) and the role played by eosinophils has made a very major contribution to an expanding knowledge of allergic diseases that are so prominent in the UK and a major cost to the NHS.

27. In summary, the UK's investment in science for development is very well regarded worldwide for its relevance and impact. It has already built considerable capacity in developing countries by training young scientist. Central to this achievement is the quality of the sciences that includes basic and adaptive research. However, there is a real risk that future impact could be reduced by a trend towards apparent quick fixes, short term solutions and lack of appropriate funding just at a time when the health status of human and animal populations in developing countries is at a all time low and the threat to the of exotic human and animal infections to the UK's health and trade are increasing.

28. Three mechanisms for funding science for development can be envisaged. First, direct funding to UK scientists in the form of competitive grants that are science-led in areas of demand and that include basic science with long term objectives. Second, support for regional forums that set the research agendas and commission research of a more adaptive type from independent implementing institutions that also involve direct collaboration with the UK science base. Third, continued and increased support for the INCO-0DC programme of DG research of the European Union.

DFID and its predecessor, ODA, have an excellent record of support for innovative and appropriate science for development.

Relevant appointments:

1. Department of Pathology, University of Cambridge (1979-94).
2. Centre for Tropical Veterinary Medicine, University of Edinburgh (1994 to date, Director 1994-2000).
3. Seconded to the International Livestock Research Institute, Nairobi, Kenya (2000-03, Deputy Director General 2000-02).

## APPENDIX 49

### Memorandum from the Institute of Water and Environment, and the National Soils Resources Institute, Cranfield University

We are multi-disciplinary institutes, comprising a broad range of natural scientists, social scientists, and engineers. As Institutes our common Mission includes a commitment to the application of good science and technology in the service of international development.

We stress the importance of *integration* of social and natural sciences and technology in international development research and action. The separation of social, institutional, economic and policy issues from science and technology in their narrower sense is extremely dangerous and damaging.

We believe there is a need to *clarify the role of science* as a basis for informed policy design and implementation. In relation to risk, it is critical that key vulnerabilities and risks associated with development are identified, and that appropriate science is funded to plug knowledge gaps and reduce uncertainties. In relation to opportunity, science and technology should be developed to enhance the competitive advantage of developing countries, and so bring about sustainable development.

It is important to point out that, despite receiving some public money, *UK universities and research institutions* operate under a financial regime nowadays which puts them closer in character to private sector organisations than public. This is important when considering the retention or otherwise of a strong science base and reactive capacity in the UK relevant to international development.

Our knowledge of relevance to the Select Committee's inquiry arises mainly from our experiences with DFID, British Council and the Research Councils. Consequently most of the points we make reflect this context.

Concerning the use of science (in the broad sense) in UK international development policy and action, we are concerned that:

#### 1. *Ownership of research in DFID*

There is an apparent lack of ownership of, and commitment to, research within DFID. This is evidenced by the numerous recent questions which DFID has raised about their Knowledge and Research (KaR) Programme, and the long drawn out process which is presently under way to determine future directions.

#### 2. *Research and Uptake*

There appears to be limited understanding within DFID of the links between research and the uptake of its findings into international development policy and practice. It is rare to be able to directly link the findings of short-term research projects to specific changes in practice. In reality, research programmes over the long term can influence change over a correspondingly long term.

#### 3. *Long-term Support*

DFID seems to lack reliable ways of distinguishing between completed research projects which show considerable promise, and which should be supported over the longer term—to bring about widespread uptake—and those which were ill-conceived or simply failed to deliver potentially useful outcomes. The lack of long-term support to promising research areas is a major issue.

#### 4. *Partnership*

There appears to be little real commitment to partnership, capacity-building, and enabling developing country scientists to develop their own research agendas and programmes. We consider it essential to the future growth of economies that developing countries build their own science base, with support from the UK and others; as it is, the UK does some of its science in developing countries, with support from National scientists.

#### 5. *Data*

Developing countries commonly lack capacity (in terms of equipment, staff and resources) to monitor their natural environments. This is a fundamental issue in regard to national science, technology and development programmes.

#### 6. *Training*

The contribution of the UK to training of developing country scientists and engineers is very limited. The value of bringing such people out of their own environments to learn and reflect with their peers from other developing and developed countries is under-rated by the British Government. DFID expects UK universities to share the costs of its shared scholarship schemes, while failing to understand the financial realities facing these institutions nowadays.

— *Recommendation*: greatly strengthen and reinvigorate the British Council Scholarship Programme.

### 7. *Short-termism*

DFID and its country programmes emphasise the acquisition of short-term knowledge, rather than long-term, in-depth, research. There is a danger that this leads to superficial understanding and to ill-founded policy.

- *Recommendation:* implement a long-term research framework to address cross-cutting and emerging issues.

### 8. *Research Councils*

The UK Research Councils specifically prevent the employment of foreign (non-UK) nationals as PhD students. EU students are eligible for fees-only, non-EU students are ineligible. At a time when demand for such studentships by UK nationals is low (because of debt, among other factors), and applications from competent developing country nationals are forthcoming, this seems perverse. Linkages between DFID and the Research Councils are weak. A coordinated approach to international development science is needed.

- *Recommendation:* facilitate an overseas student PhD programme, on subjects of relevance to international development, through Research Council channels.

### 9. *UK Capacity*

The capacity of “UK Ltd” to do good international development science is being eroded by a number of factors including: (a) the lack of interest in such issues by the research councils, (b) the disorganisation within DFID at the present time, (c) the limited funding available compared to the number of researchers bidding for funds. UK science and technology expertise in relation to international development is an asset under threat. The benefits to the UK, to developing countries, and to other developed countries of maintaining this human and physical resource base are enormous.

### 10. *Development “fashions”*

Within DFID, the pendulum constantly swings. At one time infrastructure was considered to be crucial; then environment; at present social science. In reality an integrated approach is needed, fusing the best social science and natural science with engineering. Knowledge of natural resources (land, water, vegetation, climate) and of social demands for resource use logically should precede policy and allocation decisions, law and institutions, with engineering interventions following from the preceding areas of science and policy-making. For example, the sustainable use of water for food, people, industry and environment relies on a clear understanding of the extent and current use of water resources, but the capacity to monitor these resources and to inform planning and regulation is negligible in many countries. A common result is inappropriate and unsustainable development.

### 11. *Global or local solutions?*

DFID constantly seeks multi-country comparisons and regional or global policy outcomes in its contract research. This flies in the face of the country-specific nature of fundamentals such as culture, social values, institutional arrangements and natural resources. The devil usually lies in the detail.

### 12. *Capacity Building*

Capacity-building, like research, is a long-term process. Short-term programmes and linkages are of limited value compared to partnerships continuing over the long term. We are committed to playing an effective part in long-term capacity building, but the opportunities to do so are limited.

### 13. *Private Sector*

Involvement of the private sector can be of value, in a strong public sector/regulatory environment. The private sector can deliver specific outputs against detailed terms of reference, if properly managed. What it cannot do is to deliver the capacity on the part of national scientists and engineers to learn and to think independently. The increasing move on the part of DFID toward budget support makes it more difficult for public-private partnerships to be established for the benefit of developing countries.

### 14. *Research Funding*

UK funding for international development research is severely limited, being dwarfed for example by the research programmes of large agrochemical and pharmaceutical companies. The funding status of the UK development programme overall (and thus inevitably for research) with respect to our national GDP also compares very unfavourably with other developed countries.

## APPENDIX 50

**Memorandum from the Royal Botanic Gardens, Kew**

The Royal Botanic Gardens, Kew is a scientific, amenity and educational organisation. It has an annual turnover of c. £30 million, of which c. £20 million is grant-in-aid. 200 botanical scientists are employed by RBG Kew. Most of RBG Kew's botanical work is carried out collaboratively in some 50, principally tropical, countries in Africa, Asia and Latin America, including UK Overseas Territories. RBG Kew research is focused on increasing knowledge and understanding of plant and fungal diversity—how it came to be, what its current status is, how it can be conserved for future generations and how it can be used in sustainable ways for human benefit. Together with its conservation and sustainable use partners overseas, RBG Kew has over the last three years carried out over 8,400 assessments and reports of species use and species conservation status and requirements. During the same period it has produced over 1,200 research publications and compilations. An increasing proportion of these data is made available through its web based electronic Plant Information Centre (ePIC). Through the Millennium Seed Bank Project, RBG Kew will provide greater financial and technical resources than the World Bank in support of Article 9 of the Convention on Biological Diversity (CBD) and the Global Strategy for Plant Conservation (GSPC) with respect to plants of the tropical drylands. RBG Kew's interests overlap with those of DFID, principally with regard to its responsibilities for biodiversity.

## DFID AND BIODIVERSITY

Through its Global and Environment Team, DFID represents the UK Government on the Council of the Global Environment Facility (GEF). The Council is responsible for developing, adopting and evaluating the operational policies and programmes for GEF-financed activities, which enable developing countries to play their full part in global solutions to six complex issues.

- Biodiversity;
- Climate change;
- International waters;
- Land degradation;
- The ozone layer; and
- Persistent organic pollutants.

Clearly, there is great potential for synergy between the outcomes of RBG Kew's efforts in the survey and inventory, conservation and sustainable use of fungal and vascular plant biodiversity and DFID's role in overseeing the development and adoption of GEF-financed activities in biodiversity.

## RESPONSES TO THE COMMITTEE'S SPECIFIC POINTS

(a) *The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID.*

Currently, there are no formal meetings between DFID and RBG Kew, either singularly or as part of a larger group with other major biodiversity institutes, which seek to integrate policy and activity. Such co-ordination of research support for government policy would be helpful between DFID and Defra and Kew. The Environment Policy International section of Defra is the alternate to DFID on the GEF council.

Informal contact between RBG Kew and DFID has taken a variety of forms, including through membership of groups such as the UK Group on Plant Genetic Resources (UKPGR), the UK Overseas Territories Conservation Forum (UK OTCF) the Tropical Forest Forum (TFF) and the Illegal Logging and Trade Group (ILTG). There has also been more formal involvement in the form of DfID-funded projects in which Kew was involved as participant or co-ordinator, for example projects at Limbe Botanic Garden in Cameroon, at the National Museums of Kenya, Plantas do Nordeste in Brazil and the Pilot Project for Botanic Gardens on access to genetic resources and benefit sharing. In addition individual members of Kew staff have been involved in a wide variety of DFID funded initiatives, including the DENDROGENE project and the Flora of the Reserva Ducke in Brazil and recent initiatives on the development of field guides to tropical plants.

Communication between DFID and individual experts and research units at Kew continues to be excellent, in particular with regard to illegal logging and timber trade issues. However, there is a general perception that biodiversity has become a low-priority issue for DFID since 1997, despite the explicit acknowledgement in DFID literature that DFID is committed to making biodiversity work for the poor.

It needs to be considered whether DFID's objective of "mainstreaming" biodiversity considerations into development strategies (rightly focused on poverty alleviation) allows the links with the biodiversity science and technology base in the UK to be fully engaged. It is our perception that scientific innovation and expertise could be developed further so that biodiversity considerations can be better factored into overall development strategies. There is a need to create specific mechanisms to achieve this.



(b) *The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes.*

RBG Kew's experience with DFID suggests this is principally informal, with the notable exception of the Biennial Development Policy Forum 2002. One way to enhance this process might be to reinvigorate DfID links with the Defra WSSD group which existed prior to the Johannesburg summit and to encourage further interactions with major research institutions.

(c) *The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes.*

Investment in research and promotion of innovation do not always translate directly into social outcomes such as poverty reduction. There is a need to balance short-term solutions to address immediate and critical problems with systemic, medium-to long-term change based on a strategic view.

(d) *The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them to overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes.*

RBG Kew's recent direct involvement with DFID has been relatively small. Our contributions to DfID projects tend to result from requests by scientific peers from developing countries rather than direct collaboration between DFID and RBG Kew. Kew's wealth of data and expertise in the sustainable use of plants and our NGO contacts in developing countries represent resources which could be used more effectively through closer and more direct collaboration with DFID.

(e) *The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced.*

While Defra co-ordination is key with respect to biodiversity policy there is scope for greater clarity from DFID in relation to resources directed to biodiversity and related issues. This would greatly enhance the ability of potential players from all sectors to identify areas in which they can contribute and partners with which they can work. RBG Kew's experience is that in these situations public/private partnerships can develop relatively easily.

(f) *The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

The experience of RBG Kew is that most training provided by Kew to overseas colleagues and partners in biodiversity issues is through Kew's own initiative, rather than in response to any consolidated UK plan. Moreover, we have the experience and the contacts to do much more in the area of training for biodiversity assessment and management within a development context and would be interested to respond to any new initiatives in this area. With regard to subsequent utilisation, this is often determined by the UK institute's capacity to follow through and provide both technical back-up and financial support. There is scope for greater and more positive interaction between DFID, Defra and the major research institutions in this regard.

November 2003

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## APPENDIX 51

### Memorandum from the International Development Research Centre (IDRC) of Canada

*"It is a stroke of genius to work where the problems are"* Ged Davis, IDRC governor, Vice-President, Shell

1. It sounds obvious, but this recent observation by a member of the IDRC Board sums up the essence of IDRC's approach: for the most part, the Centre channels funds and intellectual support to developing country researchers working in their own institutions in their own countries—in other words "helping others to help themselves". In this way, over 33 years, IDRC has made a significant contribution to indigenous research capacity in developing countries and, at the same time, to addressing the problems of chronic poverty in those parts of the world. This note describes the main aspects of the approach:

- learning by doing;
- training;
- networking;

- Canadian collaboration; and
- strengthening and creating institutions.

#### THE INSTITUTION

2. IDRC specialises in “research for development”. Created by a special Act of Parliament in 1970, the Centre “is not an agent of Her Majesty” and is governed by an international board of 11 Canadians and 10 non-Canadians, nine of whom are from developing countries. Although the core funding is provided through an appropriation by the Canadian Parliament, IDRC is not part of the government.

3. The IDRC mandate, as laid out in the Act, is (*inter alia*):

“to initiate, encourage, support and conduct research into the problems of the developing regions of the world and into the means for applying and adapting knowledge to the economic and social advancement of those regions, and

to assist the developing regions to build up the research capabilities, the innovative skills and the institutions required to solve their problems.”

4. In carrying out this mandate, the Centre has put most of the emphasis on “encouraging and supporting” research in local institutions; it does not conduct its own research. About one-fifth of its program spending is devoted to collaborative research between Canadian and developing country researchers (split about 50:50).

5. Although it has two main strategic goals, to support research that leads to poverty alleviation and to strengthen research capacity in developing countries, IDRC has found that the two go together and reinforce each other. So while this note deals with research capacity-building, the same activities also aim to produce research that is scientifically valid, relevant and applicable to local problems of poverty.

6. With a core grant from the Parliament of Canada of Can\$108 million (approx. £48 million UK) for 2003–04, and about Can\$15 million (approx £7 million UK) in partnership with other donors, IDRC has a program budget of approximately Can\$75 million (approx. £34 million UK).

7. IDRC has 350 staff: 200 at headquarters in Ottawa and 150 in regional offices in Uruguay, Senegal, Kenya, Egypt, India and Singapore. Of these, 60 are program officers, the highly qualified front staff who interact directly with the researchers in the field to develop, monitor and follow up on the research projects. In contrast to other donors in this field, IDRC can be described as “labour-intensive”. Against the relatively high staff costs can be set at least two advantages: (1) the IDRC staff do not do any research, so their partnership with researchers in the field is supportive and advisory, with no risk of competition; (2) the staff come from a single institutional culture that values a high degree of respect for the autonomy of the developing country researchers. Other donors tend to contract out the partnering relationship to their own domestic research institutions, who usually expect to carry out research themselves and who come from a wide range of cultures and attitudes to developing countries.

8. Programs fall into three broad areas: Social and Economic Equity; Environment and Natural Resource Management; and Information and Communications Technologies for Development (ICT4D). Within these areas, problem-oriented program initiatives are conceived and implemented in partnership with researchers and policy-makers in developing countries.

9. Program priorities are derived from three broad sources:

- (1) development needs as expressed by developing countries;
- (2) IDRC’s assets—its international board of governors, regional presence, networks, and staff expertise; and
- (3) Canadian foreign policy and development assistance objectives.

10. Evaluation evidence indicates that IDRC is not perceived as imposing its views and that it does fulfil its mission of “helping people of developing countries to create, adapt and acquire the knowledge they judge to be critical to their own prosperity, security and equity.” Several factors contribute to the sensitivity of the Centre’s programming to local needs: its international governing board; the arms-length relationship with the Canadian government; the significant field presence; and the labour-intensive interaction between IDRC employees and researchers and policy-makers in developing countries. IDRC listens to and supports people to work in their own milieu.

#### APPROACHES TO CAPACITY-BUILDING

1. *Learning by doing*—“research in, by and for developing countries”

11. The basic philosophy of supporting research in developing country research institutions, by developing country scientists and scholars, for the needs of those countries, was laid down by the first president and inaugural board of IDRC in 1970 and has remained as the core of its work since then. Most of the support serves to build individual skills and capabilities; IDRC has directed little of its small resources to the larger task of strengthening the capacity of research institutions *per se*.

12. Given the very low levels of spending on R&D, even well-trained scientists in developing countries have relatively few opportunities to exercise and increase their capacity to carry out research. Salaries are low, teaching and other duties take precedence, and supporting infrastructure is weak. In these circumstances, even small amounts of money make a big difference.

13. By directing support to those researchers who chose to remain in their countries, the risks of brain drain to the North are reduced.

14. At present, IDRC is supporting more than 700 researchers in over 400 institutions located in 76 developing countries through 482 active projects with a total value of Can\$128 million (£58 million UK). The regional balance is roughly 50% in Africa and the Middle East, and 25% in each of Latin America and Asia. IDRC balances the development of partnerships with new recipient institutions, with long-term commitments to researchers and research problems through multi-phase projects.

15. Some lessons learned from “learning by doing research projects”

- the senior researchers from/in developing countries who are leaders of IDRC-supported projects are fully responsible for all aspects of the projects and find this to be beneficial in terms of skills development;
- projects leaders gain new perspectives on research and development issues through interaction with IDRC staff and fellow researchers at meetings and conferences;
- researchers have reported that the project experience has helped with career development by linking them to networks of other scientists and organizations, and it has given them confidence;
- the researchers have used their project findings to influence policy-making, either as academics, civil servants or members of the NGO community; and
- a commitment to capacity-building requires perseverance and long-term commitments to researchers and to specific research problems.

## 2. Training

16. Most training is funded through projects and is therefore related to the purpose of the research, although the Centre also has general awards programs. About two-thirds of the training is informal, ie short courses, seminars, group training. Most of the formal training is for post-graduate degrees, with a preference for Masters level. More than two-thirds of formal training takes place in the developing regions. IDRC has placed particular emphasis on training in multi-disciplinary approaches to problem-solving. Overall (formal plus informal), the training is aimed at subject skills needed for the projects; at basic skills such as data collection and analysis; and at skills for enhancing institutional capacity, such as delivering training programs.

17. Over the last four years, IDRC has invested over Can\$26 million (approx. £12 million UK) in awards projects and in specific training components within research projects and programs. Through individual awards and components of research projects, IDRC supports field research in the South by Canadians and developing country nationals at the Masters, PhD and post-doctoral levels. Training activities within research projects also include training seminars and workshops, and short-term training. IDRC also supports internships, post-doctoral research awards, sabbaticals and professional development awards. In calendar year 2002, the Centre supported 35 awards to developing country nationals through various program units, the regional offices and the Centre Training and Awards Program.

18. Some lessons learned from the training experience:

- almost all trainees *return home* after studying abroad, pointing to the advantage of linking the training to the research projects;
- the most common problem is a chronic *lack of research funds*, preventing trainees from practising research when they return home. Institutions are poor and donors, including IDRC, tend not to fund projects for more than a few years; and
- training can open up research in new areas by *acquainting scientists with new fields*, eg science and technology policy; health systems research.

## 3. Networking

19. IDRC has put great emphasis on forming networks of researchers working on similar problems in different countries. This practice contributes to the goal of producing valid and relevant research results, but it also contributes to capacity-building through exchange of information, research experience and results; the creation of a peer group; and assembling a critical mass of researchers and resources when it might not be possible in any one institution or country. Some networks explicitly provide training and supervisory services to participants working independently in their own research areas.

20. IDRC supports 160 Southern institutions in 144 projects that support networks or have network components. The average amount spent on networking in these projects is Can\$260,000 (£115,000 UK). Through Canadian collaboration and collaboration with other Northern recipients in North-South partnerships, IDRC supports the participation of approximately 200 institutions in networks and networking activities.

21. Some lessons learned from the network experience:

- networks are built on the assumption that the members have a solid institutional base from which to operate. This is not always the case. Donor funds can attract scarce talent away from its institutional responsibilities and networks can end up being *parasitic on host institutions*;
- networks based on too wide a *range of weak and strong* institutional capacity do not work as well as those based on members with similar capacities; and
- networks can be a stimulus for the production of better quality and more relevant *scientific output* in a region.

#### 4. *Canadian collaboration*

22. IDRC's support to collaborative research between Canadian and developing country scientists was reinforced in response to the 1979 UN Conference on Science and Technology for Development and levelled off at about 20% of all programming.

23. This work has emphasised capacity-building: for developing country researchers, through close cooperation with Canadian researchers and access to new techniques and experience; and for Canadian researchers, through the opportunity to look at their work in a different and broader context, and adapt their approaches to conditions in other countries. The partnerships are intended to be of mutual benefit, in contrast to technical assistance. The impetus should come from the developing-country side, so that the agenda is not dominated by the interests of the richer partner.

24. IDRC currently has 100 active projects involving Canadian collaboration with 66 different Canadian institutions: 45 universities, 15 NGOs, four public institutions, one interdepartmental institution and one private institution.

25. Some lessons from the experience with Canadian-developing country collaboration:

- the role of the IDRC program officer in advising whether or not a Canadian partnership will enhance the work is critical to ensuring that the aim of the project is not diffused;
- preparation is key: preliminary workshops and planning meetings between the Canadian and developing-country research teams are often needed to clarify the nature of the partnership and the research agenda;
- the collaborative work should be conducted with an eye to the longer term when IDRC support ends: how to engage other sources of support so that work can continue and the partnership be sustained?; and
- one survey of developing-country researchers who had collaborated with Canadians indicated that they valued the increase in their ability to design research, to prepare proposals, to implement valid scientific methodology and to write up results.

#### 5. *Strengthening and creating institutions*

26. As indicated, IDRC has invested very little in direct institutional support; it has contributed to institutional capacity almost entirely through supporting research projects. It is clear that the project mode of support has many imperfections from the point of view of a research institution in a poor country trying to provide a complete range of teaching and research services. Consequently, it is IDRC policy that: "... the widest range of assistance that can be provided will be confined to those countries with the most limited research resources and lowest levels of income." In such cases, project budgets include a more generous allowance for equipment, software, staff costs, materials, maintenance and management training.

27. In practice, project support can assist with enhancing the reputation of an institution, and increasing its ability to prepare proposals and raise funds, to disseminate its work and to manage its programs.

28. One exception to the general pattern of project support is a series of grants to economic research institutions in Africa to cover core costs and to provide technical support to improve administrative and managerial capacity.

29. IDRC has also created some institutions in the South, either by incubating them within the Centre and then spinning them off as independent entities, or by supporting their separate establishment from the outset. The African Economic Research Consortium is an example of the former approach; and the World Agroforestry Centre (formerly ICRAF), based in Nairobi, illustrates the latter.

30. Some lessons learned about strengthening and creating institutions:

- *time* is of the essence: whether strengthening or creating, it is important to sustain support for long periods to have prospects of success;
- the greater the degree of core institutional support, the greater the potential for creating dependence on external funding; even while recognizing the importance of a long-term relationship, attention should also be paid to ways of increasing *institutional autonomy*;
- giving researchers an opportunity to *work in their own institutions* with adequate funding is an important way of supporting and strengthening those institutions; and
- institutional capacity can be considerably enhanced by repeated project funding, provided that support is sensitive to particular needs of the institution: in other words, project support should be *flexible*.

November 2003

## APPENDIX 52

### Memorandum from Ralph Cobham

#### 1. PREAMBLE—CREDENTIALS

1.1 For over 30 years I have worked as a consultant on international development projects in the overall pursuit of sustainable development. The main components covered in that work have involved natural resource planning and management, institutional development and capacity building, together with the design of integrated packages of supporting measures (economic and legal instruments, training and public awareness programmes, along with cost-effective enforcement measures).

1.2 My fields of professional competence cover agricultural sciences, applied economics, along with environmental planning and management. For many years I have been a Fellow of both the British Institute of Agricultural Consultants and the Chartered Landscape Institute.

1.3 Following seven years with ICI, I was senior partner of Cobham Resource Consultants (1973–96), then a Director of Scott Wilson Kirkpatrick & Co Ltd (1996–2000) and subsequently an independent consultant.

1.4 Clients have included particularly DFID, as well as the World Bank, IADB, the EU, many bi-lateral aid agencies and international NGOs (IUCN, WWF and IIED), as well as overseas governments.

#### 2. SUBMISSION

##### (a) *The use of science in development policy*

2.1 In recent years my experience has been that DFID has disappointingly seemed to reduce the contributions of science and technology in the formulation and especially the implementation of development policy. This has been particularly noticeable on projects designed and implemented by DFID in Nigeria and the Russian Federation. Increasingly it has seemed that development policies and their application have been driven by ideologies eg the single-minded and narrow pursuit of “good governance”. This has been at the expense of “sustainable development”, which demands the integrated application of natural and social/political sciences along with the use of economic and technological skills.

2.2 As a result, hitherto well-regarded DFID projects in the Cross River and Benue States of Nigeria, which focused directly upon the development needs of both local communities and national/local government institutions, have been discontinued/abandoned. The above statement represents neither direct nor implied criticism of the choice of “good governance” as a policy objective, but rather of the seeming failure to recognise that it can and should be pursued in a multiplicity of ways. The latter include the design of primary, secondary and tertiary economic sector projects, which are capable of generating direct and tangible benefits to targeted stakeholders and through which “good governance” can also be delivered.

2.3 The discontinuance of long-standing projects, which were beginning to reach a point of generating sustainable development for the stakeholders involved, has been both counter-productive and wasteful. Much progress—slowly won over several years—has been undermined in relation to (i) the building of long-term trust between recipient and donor, (ii) the fulfilment of community expectations and (iii) the achievement of “pay-backs” for the investments made on behalf of UK taxpayers.

2.4 With the break-up of the formerly strong NRI, the contributions of science and technology to the formulation and implementation of development policy have seemingly declined, at least in some countries. For example, the fundamental need for a study of the inter-relationship between agricultural and forest management systems, prior to designing policies and programmes for sustainable forest management covering 1 million hectares of tropical high forest in Nigeria, was strongly resisted by the DFID personnel involved.

(b) *Investment in research etc in developing country level development programmes*

2.5 As someone, who was for a short-time a member of the preliminary team responsible for exploring the nature of the State and Local Government Project in Nigeria, it was noticeable that science and technology inputs were in short supply and poorly harnessed. Again, the wrong development questions appeared to be asked and pursued, because of the presumption in favour of a governance-led approach.

(c) *Ways in which UK private sector and public/private partnerships in research, knowledge transfer and capacity building programmes can be enhanced*

2.6 Having both helped to design and participate in both aid-recipient country and UK-based training programmes and conferences, I can vouch for their generally positive contributions. However, due to their short-term nature, such events are usually regarded by participants as one-off experiences, which, whilst providing stimulation, are often quickly forgotten upon return to the constraints of the work place. In contrast, I have observed that on the relatively rare occasions that overseas or in-country secondments have been arranged through counterpart or equivalent/relevant organisations, the benefits have been substantial. As a capacity building vehicle, such programmes/initiatives, involving training through day-to-day observation of policy planners, decision-makers and implementers in action, merit expansion.

2.7 The encouragement of greater co-operation between public and private sector organisations (through fiscal and grant-aid measures or transparent contractual arrangements) should enhance both the provision and performance of capacity building programmes.

2.8 It is helpful for such programmes to include a significant policy performance analysis component. Through this, secondees and trainees should benefit from being involved in pluralistic examination of both policies and implementation programmes that have been either only partially successful or largely unsuccessful.

2.9 The provision of further one to one coaching/mentoring, following return to the home country, is recommended as part of the array of capacity-building tools. I have witnessed at first hand the benefits associated with such mentoring, whilst working on a DFID-funded project in Egypt during the second half of the '90s.

2.10 From experience of recently working on a DFID-funded environmental management strengthening project in Siberia over 3.5 years, I would also advocate the development and use of much more long-term monitoring and mentoring programmes, post-“project completion”. A period of 3.5 years is far too short for the achievement of sustained capacity building. Provision needs to be made for follow-up mechanisms that enable institutional performances to be nurtured, monitored and mentored over a realistic longer time-period.

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## APPENDIX 53

### Memorandum from Professor Julian Evans

This evidence is based mainly on the period of Professor Evans<sup>64</sup> independent chairmanship, from 1994 onwards, of the advisory committee (PAC) of the DFID Forestry Research Programme (FRP), one of 10 competitive grant programmes in DFID's Renewable Natural Resources Research Strategy (RNRRS, 1995–2005). The factual basis for the evidence is mainly in the revised strategy for FRP (1995–2005, approved by DFID) in 2000), the annual reports from FRP which must be endorsed by the advisory committee before passing to DFID, and from his chairmanship from 1998 of the UK Tropical Forest Forum, a civil society group which interacts with the (Whitehall) International Forestry Group and other central Government Departments and Agencies.

Forest-related research has been funded continuously by DFID, and its predecessors the Overseas Development Ministry and the Overseas Development Administration (ODA), since 1963. In that year, the UK Government responded to the urging of the 1962 meeting of the sixth British Commonwealth Forestry Conference to provide centrally-funded support for the resolution of some priority problems of global significance. Until 1989, the scope of the centrally-funded forest research was determined by the ODA Senior Forestry Adviser in consultation with other ODA technical advisers especially in natural resources, and with other funding bodies as appropriate.

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<sup>64</sup> Professor Julian Evans is a former Chief Research Officer for the Forestry Commission of Great Britain (1989–97), is currently Professor of Tropical Forestry, Imperial College London and also serves on the board of the international relief and development NGO Tear Fund. He is author of a standard textbook on tropical tree plantations (shortly to be published in its third edition) and is a global authority on sustainability of tropical and sub-tropical forest plantations, with residential experience in Papua New Guinea and Swaziland. Earlier this year he chaired the United Nations Forum on Forests intersessional conference on the future of planted forest worldwide at the invitation of the New Zealand government and supported by DFID and the Forestry Commission.

In 1989, in response to the rising work loads of the ODA technical advisers and the increasing complexity of the research, the management of centrally-funded forestry research was contracted out to the Oxford Forestry Institute (University of Oxford) which had been the executor of the majority of the ODA forestry research projects until that year. Following an external review in 1995 and a bidding process, management of the DFID Forestry Research Programme (FRP) was transferred to Natural Resources International Ltd. in 1997.

The FRP annual budget is about £2.3 million, from a high point of £3.4 million in the early 1990s when the UK was most interested in overseas development associated with the application of principles and UN framework conventions agreed at the Earth Summit at Rio de Janeiro in 1992 (UNCED'92). The 10 RNRRS programmes spend about £20 million per year, the largest slice of the nine or more ODA/DFID research budgets totalling about £70 million.

*The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HIM Treasury, DTI, OST, FCO, the British Council and DFID.*

The head of the Research Section in the Natural Resources Research Department of DFID (later, the Rural Livelihoods Department and now known as the Central Research Team) or the most senior of ODA/DFID's Natural Resources advisers was a member of the NERC Resource Strategy Group until 1999. This position facilitated relations between FRP and NERC's Centres for Ecology and Hydrology (CEH).

Productive relations were established and have continued for forest-related research with what is now the *Natural Environment Research Council*. DFID's centralisation of the Millennium Development Goals (MDGs) as the major objectives until 2015 accelerated the shift in forest-related research from biology and technology to institutional and policy issues. That shift is consistent with the four objectives of the 1994 RNRRS, and especially the underpinning with appropriate knowledge of the DFID development projects. The shift has led to a decline in NERC participation in FRP projects, in spite of the ability of the institutes in the NERC Centres for Ecology and Hydrology to manage multi-disciplinary teams and generally to engage successfully with farmer associations and other community-based organisations. Previously, the CEH institutes had worked more with the international agricultural research centres in the Consultative Group on International Agricultural Research (CGIAR). The lack of sufficient in-house expertise in socio-economics, and the high staff costs and overheads of CEH, are major factors which make it difficult for CEH to compete for FRP funds.

The presence of NERC/CEH staff in FRP projects has helped to ensure good quality science but has not evidently led to greater influence on policy changes. Close engagement with policy shapers in DFID and in developing countries requires a more continuous in-country presence than can be afforded with the time-sliced and expensive CEH staff. At least some CEH staff have been able to adjust to the FRP instructions for the development of policy briefs for specific audiences in developing countries.

Academic training for developing country staff was sometimes supported through cofunding arrangements with the *British Council*, especially if field work was undertaken in countries where the British Council was involved in supporting capacity building in parallel development projects. DFID has generally discouraged the use of the RNRRS budgets for academic training but, as British Council funds have become less available, the RNRRS rules have relaxed slightly and some RNRRS programmes have spent considerable amounts for such training.

The Tropical Forest Forum, mentioned above in the preamble to this evidence, is one sounding board for informal coordination between government and civil society including research programmes and providing institutions. It is regrettable that, when Government is making more use of civil society fora and focus groups, it has become very difficult to keep the thousand-member Tropical Forest Forum in being through lack of UK Government support for a one-person coordination office.

*The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes.*

DFID has policies and programmes intended to be appropriate to international conventions, regional networks, and country programmes.

Forest-related international conventions and supporting arrangements include the Convention on International Trade in Endangered Species (CITES), UN Frameworks on Climate Change (UNFCCC), (Conservation of) Biological Diversity (CBD), Combatting Desertification, and the UN Forum on Forests (UNFF).

DFID provides support to the CITES Secretariat, and FRP provides specialist knowledge on tropical trees to the IUCN Species Survival Commissions which service the CITES conferences of parties. FRP contributes to the Tropical Forest Forum policy working group on bushmeat, which is funded by Defra.

Defra has the UK lead on the Climate Change Convention. FRP has funded projects on carbon management for the benefit of rural communities in developing countries; carbon emission reduction certificates can provide sustainable incomes for marginalised communities who otherwise suffer from unfair terms of trade in material commodities. Two of these projects have provided simple guides for both developing countries and UK Government Departments and Agencies on the opportunities offered by the Kyoto Protocol and the Clean Development Mechanism.

Many signatory countries have difficulty in complying with the reporting requirements of the UN conventions, let alone their practical implementation. FRP has projects to enable countries to assess rapidly changes in their biodiversity and to enable authorities and communities to identify species and earn cash income through doing so. A global e-consultation showed the benefits to governments and communities which are obtainable through a more participatory approach to management of biodiversity.

DFID commissions specific studies in support of inter-sessional meetings for progress in the UN Forum on Forests. Some of these studies draw directly on FRP project outputs. Other FRP projects have been useful for inter-sessionals funded by other donors.

International institutes in the Consultative Group on International Agricultural Research (CGIAR) are co-funded by DFID and may provide research findings which support DFID initiatives or programmes. Some CGIAR centres are also co-funded by FRP and have, in the past, had some of their notable successes almost wholly provided by FRP collaborative projects. In addition, the close contacts between FRP and the CGIAR may involve review missions (as in other RNRRS programmes). DFID co-funding of the CGIAR, like its direct funding of policy institutes, avoids the lengthy hassle of the RNRRS competitive bidding processes. A disadvantage is that the CGIAR cannot be wholly directed by DFID, unlike the RNRRS, and so its results may be somewhat more academic and less developmentally useful. But the CGIAR has a professional public relations unit, which enables its claimed and actual research results to be more prestigiously disseminated than is possible through the individual RNRRS programmes which lack such a unit.

The decentralised DFID in-country programme offices have had increasing budgetary discretion since 1997. During this period, the amount of research which they have funded on single-country problems has continued to decline.

Feedback from research into policy shaping in regional and in-country programmes has not been formalised. One major reason is the asynchrony of schedules. The DFID in-country programmes, through the country strategy papers and the replacement country assistance plans, work on 3-year cycles. The RNRRS programmes, operating competitive grant programmes for the generation of global public goods, have been perceived as being too slow for the in-country programmes which need to use the existing global knowledge base rather than to commission new research. The DFID country offices appear not to understand that it is within the mandate of the RNRRS programmes to reformulate the global knowledge base so as to make it more useful to the DFID offices. It is not always necessary, indeed it may rarely be necessary, to commission entirely new research.

*Recommendation 1: That DFID establishes links between country offices and centrally-funded research programmes, and formalises mechanisms to encourage the use and uptake of research outcomes by DFID regional and in-country offices.*

The shift in focus of the DFID country offices, from managing development programmes to engagement mainly with Ministries of Finance and Central Planning for direct budgetary support, seems to have made them even more remote from research and the utility of research outputs.

In the first three decades of ODA's centrally-funded forestry research, from 1963 to the mid-1990s, the emphasis was on biology and technology. The more focused management on explicitly-identified priority problems of the poor from 1997 has driven the shift towards policy and institutional issues. However, until very recently, we have assumed that policy briefs based on the research outputs and presented to policy shapers would be so self-evidently beneficial that the suggested legislative and regulatory changes would follow swiftly.

Latterly, we have realised that this is naive. FRP is working up a more comprehensive approach in association with the Overseas Development Institute's Research and Policy in Development project (itself part of an wider effort by the Global Development Forum). FRP has commissioned a training course on science communication and research advocacy, and the first course will be delivered early in 2004.

Meanwhile we are hampered by the lack of any explicit connection between "research" and the 25+ policy teams in DFID's re-organised Policy Division (PD), since April 2003, and with the regional Africa and Asia Policy Divisions. Although some of the PD teams have work programmes clearly related to natural resources management, their short time horizons, lack of budget this year, and (most especially) lack of mandate to engage with research programmes creates an unexpected and surely undesirable gulf. We see some danger in these short-term teams repeating studies already completed by research programmes, because DFID has replaced previous "silos" with others similarly lacking inter-connections.

*Recommendation 2: That DFID ensures there is a close and creative link between the teams of the newly restructured Policy Division and DFID-funded research programmes and projects.*

With rare exceptions, such as arise from personal interest or experience, DFID staff and offices have not developed or implemented systems for integrating research results into mainstream activities. This must be due, at least in part, to lack of political will. DFID has switched quickly from supporting development programmes and projects to sector-wide approaches, and onwards to direct budgetary support, in just a few years. It should also be able to back its philosophy of using an "evidence-based" approach with a real commitment and procedures to make use of the research which it funds.



In the last few years, it has tended to be easier to persuade another donor agency to co-fund pilot scale uptake of research results, than DFID. There are obvious psychological reasons why other donors should not do this, if a DFID in-country programme office refuses to help even while admitting that the research is potentially of great benefit to the poor.

*Recommendation 3: That DFID considers funding the continuum of pro-poor research, development and application and thus ensures that the valuable outcomes from DFID-funded research will be used by the ultimate beneficiaries.*

The STC may wish to enquire how DFID will ensure that research results are made known to and used by its various offices, and how the special knowledge acquired deliberately by RNRRS programmes (such as from in-country surveys of the needs of the poor) will be used in the development and operation of country assistance plans.

It would not be unfair to say that DFID's recent re-organisations have made it more difficult than ever to articulate its needs from research, or even to perceive that research is desirable or necessary. It is also more difficult for research teams to interact with DFID HQ and in-country programme offices, because they (the latter) have no mandate for such interaction. While the RNRRS programmes are strongly driven by the needs of the poor, it is difficult to communicate the consequences of that drive to DFID staff. This is especially true if/when the DFID in-country staff are communicating mainly with partner government staff whose own understanding of the needs of the poor is often distinctly limited.

*The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes.*

DFID has, reportedly, doubled in size since 1997, reduced or closed its regional offices and greatly expanded the number and size of in-country programmes. As noted above, this has been associated with the philosophical shift from partly donor-driven development programmes and projects to direct budgetary support. The onus is now of the partner government to decide what research it wants and to commission that research, using the fungible moneys provided through the direct budgetary support.

Most developing countries are not yet sufficiently sophisticated to make use sensibly of this freedom. The weaknesses in uptake and application of research in the developing countries is associated principally with the inappropriate structures and mandates of the national research systems, poor and intermittent training, low political status, poor record for delivering useful research and hence low utility in relation to the developmental effort

*Recommendation 4: That DFID carefully evaluates value for money when deciding the proportion of funding to make available through direct budgetary support vs. project funding, especially in view of the future of the rural poor and the attainment of the Millennium Development Goals.*

The RNRRS programmes are quite properly forbidden to engage in technology transfer, since that is the responsibility of the local partner institutions with national funding and support from the local offices of donor agencies including DFID. However, this intentional hiatus in the research-development-application continuum has led to a real deficiency in uptake and application of research outputs, both technical and policy, because of the weaknesses of the local partners. However strong the research effort, without a parallel and continuous effort in capacity building, the research will be less effective in development than it could be.

Some bilateral donors, especially in Canada, The Netherlands and Sweden, have appreciated the widespread deficiencies in the educational systems in many developing countries. They have been prepared to repair those deficiencies as expressed in the weak research systems through long-term capacity building programmes, while the UK efforts have been mainly short-term and interrupted. The imminent closure of the CGIAR's International Service for National Agricultural Research, a major centre for this capacity building but regrettably also short- rather than long-term, is an indication of insufficient staying power amongst even the major donors.

With a very few exceptions, the DFID in-country offices are not staffed or charged with giving special attention to the these weak national research capabilities. Nor do they seem to have a role in suggesting redirection of rather academic national research programmes towards solution of the urgent problems faced by the poor. It requires a sophisticated government to appreciate what research can do for development, or a sophisticated donor to promote that idea. DFID used to have that capability.

*The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them to overcome trade restrictions, and the coordination of these efforts with NGOs, charities and international programmes.*

The capacity building associated with the centrally-funded RNRRS programmes was deliberately restricted by ODA/DFID in 1995, on the then understanding that other agencies would provide. It is not apparent that ODA/DFID has attempted to encourage such capacity building, so that the local partners in RNRRS research would be able to take up and apply the results. There is no question that the RNRRS programmes engender enthusiasm and good intentions for such application, but the above-mentioned weaknesses in capability all too often reduce the developmental effects.

DFID could overcome this problem by repairing the hiatus which it created itself in the research-development-application continuum in 1994, and by putting real resources into capacity building as a necessary and perennial aspect of development assistance.

*Recommendation 5: That DFID earmarks appropriate funding and expresses long-term commitment to capacity building and institutional strengthening in our partner countries in the South.*

It could be argued that some of the training provided through the British Council was poorly planned and inappropriate. FRP experience suggests that modern training needs analysis would easily overcome these past defects and allow much more appropriate capacity building to be undertaken. Of course, that in turn requires across-the-board revision of mandates and research funding systems in-country. There are enough examples of successes in developing countries (in forestry, from Malaysia and Nigeria) to show that this is possible and sustainable.

UK-aided capacity building should not be restricted to overcoming trade restrictions. RNRRS programmes have shown the needs and possibilities for improving domestic trading arrangements to enhancing market intelligence and market access by the poor, by helping them to move along the market chain and to add value to their products and services. This will benefit the poor more directly than the (also necessary) improvement in international trading systems.

*The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced.*

The knowledge as global public goods generated through the RNRRS programmes is intended specifically to benefit the poor. This knowledge/these goods are not easily appropriated into private ownership (unless one operates in the US climate of establishing intellectual property rights on anything which is not nailed down). Most of what the poor need they cannot pay for in cash. This is even less if the private sector acquires monopolist/monopsonist positions in relation to that knowledge. The furore over ownership of genomes (rather than over genuinely innovative and non-natural expressions of genomes) illustrates the havoc which Big Pharmaceuticals can cause to the livelihoods of the poor who depend on what Nature has evolved over millennia.

That is not to say that the private sector has no role in delivery of training, or in development of technology and strategy which can then be taken up by the poor without being disadvantaged in relation to the commercial sector. Most if not all the RNRRS programmes engage with the private sector along these lines.

As outlined above, what is needed from donors is support for the pilot or demonstration scale application of research outputs. This is not a task for the RNRRS programmes as presently constituted and with no leverage or resources for such pilots. This is where restoration of the research-development-application continuum, with resources, will allow the public-private partnerships to operate, under the demand-leadership of the poor, which is what we understand accords with a core element of DFID's philosophy.

*Recommendation 6: That DFID encourages and supports the continuation of research through pilot studies and demonstration projects to ensure wide-scale adoption and application of research outcomes.*

*The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

The ten programmes in the Renewable Natural Resources Research Strategy (RNRRS), devised in ODA HQ in 1994 and formalised in 1995 from the hitherto more *ad hoc* arrangements, will be closed by DFID in March 2005, together with all the remaining centrally-funded research programmes. At the time of writing, the DFID Central Research Team has announced interim measures to sustain social science research during 1994 but has not yet developed any indication of the nature, organisation or management of other research subject areas. Likewise, the replacement for the training currently provided through the research programmes is unknown even though it will be vital for the attainment of the MDGs.

The DFID intention to close the existing research programmes before developing any replacement scheme or schemes is causing understandable uncertainty amongst both suppliers and clients of research. The STC might wish to ascertain DFID's reasons for closing the current programmes and its future intentions. The DFID Central Research Team formed in April 2003 intends to develop a new research strategy by December 2003 but is not attempting to learn from the decades of research management experience held by the organisations which currently do this work for DFID, nor from the research project teams themselves. DFID espouses an "evidence-based approach" but it is difficult to understand how this approach is consistent with the very limited consultations with those having the most relevant experience of delivering MDG-related research.

*Recommendation 7: That DFID puts in place a strategy for a smooth transition from the current RNRRS, and that knowledge, networks and research competencies accumulated over the past decades are not lost in an effort to create from scratch a new research strategy.*

Re-organisations and policy shifts in DFID since 1997 have not been thoroughly prepared or executed. Minor changes have been made to the RNRRS programmes for greater focus on poverty problems and attainment of the MDGs. However, when the functions of the DFID in-country programmes were changed, no provision was made for replacing their roles to co-fund the pilots or demonstrations of the application of research outputs.

Failures in uptake of research outputs, in DFID HQ, in DFID country offices, or in the developing countries, can be ascribed at least in part to inconsistencies in DFID's own policies and procedures. It is unfortunate that, at a time when the RNRRS programmes have their best understanding of the priority needs of the poor in developing countries, DFID is least able to make use of this knowledge for shaping development policy and practice, and is most determined to shut down these highly productive and diverse programmes.

In parallel, both before and after the re-organisation of its Policy Division, ODA/DFID has used administratively (non-competitively) awarded grants to policy-related institutions to undertake policy and developmental studies. Not having to call for competitive bids, these institutions can deliver results faster to DFID than the competitive-grant RNRRS programmes. This diversity of knowledge sources should be good for DFID, provided that there are adequate mechanisms to avoid overlap; and, crucially, provided that the policy-related institutions really can build up teams of the same quality as the competitive systems. Moreover, and traditionally, DFID has imposed fewer "add-ons" to the policy contracts than to the RNRRS programmes, making them still more agile.

Whether DFID can then use the results of either the RNRRS programmes or the directly-awarded policy projects has become more questionable. While DFID HQ may perceive the needs and connections, the DFID in-country programmes have decentralised responsibilities and operate to the rhythm of different drums. The communication and feedback mechanisms which should have been built into DFID's decentralisation processes have been weak or absent. We welcome the greater attention which is being given to communication in DFID, but trust that this does not represent a one-way channel from Permanent Secretary downwards.

*"In announcing the inquiry, the Chairman of the Committee, Ian Gibson MP, said 'We want to see how effectively the Government, and not just DFID, is using science and technology to underpin its international development policy. Is UK science contributing effectively to the long term prosperity of developing countries by helping them to develop a scientific capacity, or are we just tackling short term problems as they arise? We'll be looking to see if DFID's policies on development complement or conflict with OST and DTI's responsibilities for UK science and innovation. Is Government giving with one hand and taking with the other?'"*

My notes above suggest that DFID and also Defra are taking rather short-term views, notwithstanding the espousal of the Millennium Development Goals and the associated Public Sector Delivery Agreements. The weakness of the national research systems (public/private/independent) in most developing countries, due in large part to poor educational systems and to governance not based on objective evidence or related to the needs of the poor, needs a perennial effort to build and maintain capacity. In our experience, this capacity needs to be built through formal training associated with programmes and projects intended to solve the priority problems of the poor. This is not how many national research systems are currently established or operated. The UK has vast experience, still but declining, in how to run research-development-application continua. DFID should support that rather than close it down for what appear ideological reasons. How is that (ie closure) for an evidence-based approach?

There is no doubt that the University research assessment exercises are inimical to collaborative work with partners in developing countries. The RNRRS programmes have learned how to work around this constraint, but it would be better not to have this limitation.

Finally, I draw to the attention of the STC that the UK exerts considerable influence on international research and policy shaping through DFID-funded projects. This extends to leadership in international, regional and thematic research networks, where UK experience in research management as well as its scientific excellence is highly regarded. Is DFID really going to call a halt to this influence, just as the European Research Area is expanding? What happened to "punching above our weight"?

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## APPENDIX 54

### Memorandum from AstraZeneca PLC

AstraZeneca is a major international healthcare business engaged in the research, development, manufacture and marketing of prescription pharmaceuticals and the supply of healthcare services. It is one of the top five pharmaceutical companies in the world with leading positions in sales of gastrointestinal, oncology, cardiovascular, neuroscience and respiratory products.

#### ASTROZENECA'S RESEARCH INVESTMENT IN INDIA

In June 2001, AstraZeneca announced a five-year, \$35 million commitment to finding a new treatment for tuberculosis by setting up new laboratories in Bangalore, India, totally dedicated to TB therapy research. Called the Bangalore Research Institute, it is the only research programme of its kind in India to be funded by a pharmaceutical company. More than 60 scientists from leading research institutions around the world have been recruited to the new laboratories in Bangalore to work closely with AstraZeneca's infection research centre in Boston, USA and in Cheshire, UK.

The benefit of setting up laboratories in Bangalore are to tap into India's strong science culture, while and at the same time to discover, develop and manufacture a new agent in a low cost-base country in an attempt to keep down overheads in an area where most patients will be unable to pay.

AstraZeneca has also set up a charity in India called the AstraZeneca Foundation to help promote the teaching of science in India.

#### CLINICAL TRIALS

AstraZeneca has a growing clinical capacity in countries such as South Africa and China which has developed not from incentives offered by the UK, but from goodwill in the countries involved.

#### RECOMMENDATION FOR ACTION

As India and China develop their own pharmaceutical expertise, they will become very attractive locations for growth and investment compared with the UK and Europe. Therefore, AstraZeneca would recommend that the UK acts to develop close links in science with these countries in order to provide us with greater access to their growing science base.

*November 2003*

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## APPENDIX 55

### **Memorandum from the John Innes Centre, Norwich**

The John Innes Centre (JIC) welcomes the opportunity to comment on the "The use of science in UK international development policy" as a submission of written evidence to the Science and Technology Committee.

The Committee identifies a series of specific points on which it seeks clarity and guidance. To place the views of the JIC in context the following paragraph outlines our strategic and philosophical view of the need for the UK to support science, agriculture and development in developing countries (DCs). It also summarises the previous and ongoing scientific activities at JIC supported by UK Government (DFID), charitable (eg Rockefeller Foundation; Gatsby Charitable Trust) and others.

JIC is a publicly funded research institution (through BBSRC) that has, since its inception, undertaken fundamental and strategic research in an open and collaborative way with a truly international spirit. Consequently, we have contributed to and benefited from exchanges globally of ideas and materials with organizations in advanced and DC countries. This exchange is an essential component of modern scientific progress and should be encouraged by all governments. It acts as a key ingredient in the continued development of UK agriculture and industry and provides invaluable knowledge and capacity building potential for less advantaged nations.

A major difference between the rich and the poor of the world lies in differences in revenue generation and opportunity for the exploitation of scientific ideas, and it is in the area of agriculture that the earliest and most profound opportunities reside. Despite this, the potential of plant science and plant improvement to contribute to development programmes has been relatively undervalued.

JIC has made major contributions to research in key crops such as rice, millet, banana, cassava and legumes (cowpea, chickpea etc), and trained many young DC scientists. These so called "orphan crops" are not those that will receive attention and research support from commercial sources. Hence they rely upon international publicly-funded assistance to elevate them from survival crops to sources of income generation, with the associated benefits of food security, family and social stability, and educational and societal development.

JIC has attracted long term UK Government support (via DFID) for the millet improvement and rice biotechnology programmes specifically targeted at the poor of Africa and Asia, and for smaller programmes on banana and cassava. At the end of the 2004 the Plant Sciences Programme which has funded this work will cease, and it seems unlikely that further funding will be forthcoming from DFID sources under the proposed mechanisms for development. We have also benefited from broader funding from the Rockefeller

Foundation, the Gatsby Charitable Trust and the MacKnight Foundation. However, responsive funding from these charitable donors cannot compensate for the infrastructural support from DFID) for work on all these crops that has provided the foundation for long term strategic planning in crop development.

#### THE CO-ORDINATION OF RESEARCH SUPPORT WITH GOVERNMENT POLICY ON THE USE OF SCIENCE IN DEVELOPMENT POLICY, TAKING INTO ACCOUNT THE WORK OF THE RESEARCH COUNCILS AND THE OBJECTIVES OF HM TREASURY, DTI, OST, ECO, THE BRITISH COUNCIL AND DFID

There is a broad consensus amongst plant scientists and agricultural researchers in Europe and North America that we have a moral responsibility to share our knowledge and skills to address the emerging and inevitable global shortfall in food supply in the next 50 years. Many organisations, like JIC, have articulated their ambitions in this area (<http://www.jic.ac.uk/international-laboratory/index.htm>). However, these ambitions are seriously disconnected, particularly in the UK.

We recommend that DFID create an “activity hub” that would pool and coordinate science from UK universities and Research Councils and focus on delivery of enhanced capacity and training to DCs, in many areas of science. It is in agriculture that such activity would have widest and most lasting impact.

The French Government has taken a significant step in the support it gives to “Genoplante”, a consortium of French laboratories sharing research and technologies with DCs. However, there is woefully little co-ordination at a European level.

We recommend that DFID builds on UK activities by taking a significant lead in a European effort to co-ordinate projects, and provide a clearing house, for science of potential benefit to DCs.

The demands of less developed nations are large and various. In the past, the local impact of support for infrastructure projects has been very seductive, but has this really played to the UK’s strengths? The UK science research community has always shown outstanding originality, flair and achievement on a par with any other nation. This is an extremely valuable export commodity in terms of international standing and development potential, and should be supported by Government policy and resources. In comparison with infrastructure projects science is expensive and slower to deliver. However, the positive outcomes will be more durable, penetrating and influential. Science is also based upon international principles of self-regulation through peer review and is therefore virtually uncontaminated by corruption.

In recent years, support for science assistance to DCs has been the responsibility of DFID and, on a lesser scale, the British Council. Policy reviews within DFID had endeavoured to identify where and how UK science can contribute to the agricultural priorities identified by DCs. However, the recent uncertainties within DFID have created a vacuum that seems almost to reflect a lack of confidence in UK science itself. The proposal that DFID-funded science should be “outsourced” internationally fails not only to support the UK science base but displays a clear and unwarranted lack of confidence in the potential and quality of the UK science base.

The BBSRC and other Research Councils do not have a clear collective policy on delivery of publicly funded science to the worlds poor and, despite encouraging statements from Downing Street (for example in 2001 in its support for Africa), this has not been translated into policy or action from Westminster.

We recommend that DFID take a lead in exploiting UK science in DC development by:

- (1) encouraging and coordinating research in areas of relevance to DCs;
- (2) seeking to improve integration of research funded by Research Councils, not-for-profit organizations, DEFRA and DFID; and
- (3) using DFID research programmes to build on UK or Europe-orientated but DC relevant science.

We note, with regret, the reduction of DFID science programmes; the need for good science and technology in DCs has never been greater. Many of the problems of the 21st century will be addressed by appropriate application of science and technology. As the developed world exploits its technology to competitively manage issues arising from water shortage, climate change, population increase, oil and natural resource depletion, environmental degradation etc., DCs need strong support in order to avoid being further disadvantaged.

#### THE MEANS BY WHICH DFID ACQUIRES AND USES SCIENTIFIC ADVICE IN DEVELOPING AND IMPLEMENTING ITS POLICIES AND PROGRAMMES

It is vital for DFID to assess whether it has a robust system in place to monitor emerging scientific opportunities and to integrate the results of these processes into its policy and funding decisions? In this, it is essential that DFID is sufficiently insulated from UK/Europe-centric policy and decision-making to take a “long view” on the potential benefits to DCs.

We recommend closer links with DEFRA, research councils and other research providers to ensure minimal delay in recognizing new science, technologies and management techniques.

THE EXTENT TO WHICH INVESTMENT IN RESEARCH AND THE PROMOTION OF INNOVATION PLAY A PART IN DFID'S COUNTRY LEVEL DEVELOPMENT PROGRAMMES

The comments above, particularly those that relate to mobilizing UK and European skill base to the advancement of DC agriculture, must not be viewed in isolation of the educational and skills requirements of DCs themselves. An enhanced future for DCs lies in a continuous sharing of capacity and training to minimize the technology gap between the "north" and the "south". Technology provision, as opposed to technology sharing, will not work in the long term. The current trend towards the development of regional centres of excellence for biotechnology in the developing world provide the ideal strategic opportunity for training and experience in the UK to be shared and transferred to a productive base in DCs.

We recommend that DFID establish an early dialogue with regional centres to identify an effective and long-term pipeline for technology transfer.

THE PROGRESS OF UK EFFORTS TO BUILD SCIENTIFIC, TECHNOLOGICAL AND ENGINEERING CAPACITY IN DEVELOPING COUNTRIES TO HELP THEM OVERCOME TRADE RESTRICTIONS, AND THE COORDINATION OF THESE EFFORTS WITH NGOS, CHARITIES AND INTERNATIONAL PROGRAMMES

Science is an international discipline. Hence, the difficulty is distinguishing between incidental benefit and UK-supported programmes that lead to benefit. For example, fundamental scientific findings relating to yield potential in cereals are published in the international scientific press available, theoretically, to all. This democratisation of science may lead to advances where the knowledge, skills and resources are in place. Whether this "osmosis" of scientific potential is very effective for the improvement of orphan crops in the poorest countries seems doubtful.

THE WAYS IN WHICH THE ROLE OF THE UK PRIVATE SECTOR AND PUBLIC/PRIVATE PARTNERSHIPS IN SCIENCE AND TECHNOLOGY RESEARCH IN KNOWLEDGE TRANSFER AND IN CAPACITY BUILDING PROGRAMMES FOR THE BENEFIT OF DEVELOPING COUNTRIES CAN BE ENHANCED

The UK lacks a clear philosophy and vision for the sharing and delivery of knowledge and skills to DCs and activities in this area are highly fragmented. International donor effort (eg through the CGIAR) has declined dramatically and research centres in DCs have lost many scientists. However, the need for improved and sustainable agriculture has never been greater. It is important to recognise that because of the nature of crop improvement the collapse of activities now will be felt seriously in eight to 10 years, at a time when the pressure on agriculture and food production will have increased dramatically.

On the positive side the new era of genomics also provides unforetold potential for addressing the massive problems of food security and wealth generation. To illustrate with one achievable example relevant to JIC:

Many DC staple crop plants are based around limited and poorly characterised seed collections. However, these seed collections often harbour unrealised potential in yield, and disease and environmental stress resistance. In the cases of cereals and legumes, JIC has developed resources for the rapid "genotyping" of seed collections that can establish genetic structure and lineages, speeding the breeding of new lines of crop plants. However, these genotyping methods require specialised and expensive equipment and experienced staff, not commonly available in DCs.

Current thinking seems to be divided on how best to close the gap between delivery and need. To many, the gulf between the leading edge of biotechnology and genomics relevant to agriculture and the existing potential of DCs in this area is unbridgeable. This is a council of despair. Many of the new technologies of the '70s and '80s are now routinely used in DCs. What is clear is that as providers we need to speed the transfer of skills without becoming diverted from the demands of DCs. This is a difficult balance to strike as issues such as DC staff retention, technical follow-up in DCs and the fulfillment of professional expectations under existing funding patterns in the UK, are all problematic. One increasingly popular measure in the donor community is the establishment of regional centres of excellence in DCs. For agricultural biotechnology in Africa, such regional centres are presently being created in South Africa and Kenya. These are excellent initiatives but the time and cost required to bring these centres to the forefront of rapidly advancing technological development will be prohibitive. The principle of capacity sharing between developed and developing countries is a more logical and cost effective way forward. Nevertheless, the regional centres will provide a staging post for the gradual implementation of advanced technologies and the employment of trained staff.

We recommend that DFID's role in capacity building should be as a leader and facilitator of technological transfer from the first quality UK research base to DCs. By enabling access to relevant areas of the UK research base in response to DC demands (see model proposed for the International Laboratory at JIC), DFID would establish a mode of developmental support distinctive from most other European or North American national programmes.

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**APPENDIX 56****Memorandum from the British Consultants and Construction Bureau****INTRODUCTION**

This memorandum on the use of science in UK development policy is submitted by the Chief Executive, BCCB at the request of the 300 consulting and other professional service members who cover 18 sectors encompassing well over 200 disciplines. All members are engaged in working internationally. With some 60% of the membership having undertaken projects for DFID within the last few years, BCCB arguably represents the largest single concerned commercial grouping. It should be underlined however that BCCB speaks for those in professional services rather than in the provision of goods.

Approximately £190 million of DFID's funding is for consultancy and therefore directly related to our work. In addition some of the research-related consultancies benefit from receiving research contracts allocated from another £100 million. We estimate that this is equivalent to some 7% of BCCB's members' annual fee earning worldwide. The BCCB membership represents some 40,000 people involved directly or in support of international consultancy.

UK Companies have a strong record of winning and successfully delivering development contracts for a broad spectrum of donors including DFID, World Bank, Asian Development Bank and the EC. We are concerned that any reduction in the level of funding available to UK business for scientific and technical research purposes will adversely affect the competitive and leading edge capability that the UK currently has in delivering development projects throughout the world for a broad range of donors. This will result in a potential loss of jobs for people working in or from this country, particularly amongst the SMEs. Indeed any such move would be in direct contradiction to the initiatives by the DTI and the recently introduced Research and Development tax relief scheme.

**THE ROLE OF THE PRIVATE SECTOR**

Over the past decade an increasing proportion of UK development work has been delivered by the private sector. Core funding has been withdrawn from the public sector in favour, quite rightly, of competitive contracts which offer better value for money. As a result of this change in funding, the private sector engaged in development work enjoys a far closer relationship with universities and institutions than that experienced by many other sectors. Continued investment in research is essential to maintain the competitive advantage and well established reputation of UK development work.

Many UK firms have substantial experience in development issues and recognise the growing importance of areas such as corporate social responsibility and fair traded products. The BCCB supports a greater involvement of the UK private sector in support of the emergence of free trade with developing countries.

In partnership with private Companies, knowledge has been generated by DFID funded research and development programmes over the past few decades. In this age of technological advances, the BCCB is concerned that all opportunities are taken to learn from past development lessons and resultant technologies. We urge that DFID and other donors place greater emphasis on knowledge management systems, an area where UK plc has much to offer in a global context.

The presence of British companies engaged in overseas development work in partnership with leading UK universities and institutions creates a high level of interest from developing country students which frequently results in their attending the UK for university education. These important associations can last for many years and form the basis for UK/developing country partnerships. DFID should support these capacity building initiatives, not only in the academic sector, but through the shop window provided by UK business operating overseas.

In partnerships with overseas institutions, UK companies responsible for managing DFID research programmes have developed innovative methods for delivering research at a local level. This has resulted in demand led research, buy-ins from the local recipients and the development of local capacity. The presence of local offices by UK companies is also of significant importance in terms of reputation and building links between these countries and the UK.

There are two further issues which are of significant concern to UK companies operating in the development sector and which may well affect their ability to maintain investment in research and development in coming years; the first is that DFID was one of the leading development agencies to untie aid, with others only now beginning to follow suit. The playing field is not yet level with restrictions applying in different countries; persuading other nations to untie needs to be addressed quickly.

The second is the "stand off" by IFIs when recipient countries renege on the terms of a contract. The UK Government needs to bring greater levels of influence in rectifying these situations so that UK companies continue to tender for this type of work. Without this the UK's presence, reputation and influence in international development is damaged whilst at the same time our internal expertise and capacity reduced. Some well known reputable companies now refuse, for example, to undertake World Bank projects at all, feeling the hassle involved in getting timely payment is just too great. There is a dialogue on this with the

Secretary of State for International Development, but it is also something BCCB itself has addressed directly to the Bank. As a result, we have been asked to form a working party from the private sector internationally to suggest possible solutions.

#### CONCLUSION

Continued investment by the UK Government in scientific research and development is essential to maintain the UK industry's competitive advantage and reputation as a leading deliverer of development projects throughout the world, respected by donors and recipient countries alike.

*November 2003*

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### APPENDIX 57

#### Memorandum from Philip Wardle

I am making this submission to your Committee to draw attention to the importance of forestry issues in development and in particular the importance of scientific understanding of the sector in deriving sound international development policy.

“World Forests, Society and Environment—Executive Summary”<sup>65</sup> is an excellent document to convey the wide range of forestry issues that are significant in international development and the importance of sound science in this field in ensuring viable development policy.

This publication was launched on 22 September at the XII World Forestry Congress in Quebec, Canada by the Rector of the United Nations University, Professor Hans van Ginkel and the President of the International Union of Forest Research Organisations, Professor Risto Seppälä. It is my privilege, as editor to make it available for the consideration of your Committee.

It presents research based reviews of globally relevant forestry issues developed by researchers from many countries and all regions of the world including both experts looking at the issues from without and experts looking at the issues that face them in their own countries, from within.

The Executive Summary presents major conclusions and recommendations concerning globalisation, deforestation and forest degradation, continuous scientifically based forest monitoring systems and the need for serious implementation of the G8 Action Programme on Forests. Key among the recommendations is the use of objective scientific information in decision making and the mobilization of qualified human resources adequately financed.

However, it does much more, it discusses many forestry issues relevant to the well being of society and the environment as they arise in particular countries and regions and underlines the need for understanding how to combine and balance facts and values. The threat that globalisation may result in the marginalisation of local and national institutions, particularly in developing countries, leads to the recommendation to support the opportunities offered by speeding up the diffusion of innovations, know-how and new technology.

Why is it necessary to draw particular attention to forestry issues? It is well known that forests have been at the centre of public and international discussions of “sustainable development”. However, the flow of resources directed to the issues concerning forests has been on a severely diminishing trend; this in respect of official development assistance and in supporting forest research and education. University forestry departments in the United Kingdom have been demoted or even shut down in recent years.

In part this paradox appears to be explained by a negative reaction on the part of policy makers to sensational, but often poorly informed reports on developing country forestry situations in the media and strident campaigns by powerful international NGOs with narrow interests. Balanced and objective research based assessments of needs and appropriate action, which should be the basis for policy, were not adequately available due to limited resources available in those countries.

This submission is not designed to provide specific information on the specific points listed, but to draw attention to the wide range of forestry issues, spanning those points, that have to be addressed in securing the appropriate contribution of the sector to development.

The United Kingdom has a great wealth of capacity in many aspects of the forest sector in its Universities, research institutes, private sector enterprises and non-governmental organisations. This is held in great respect by developing countries and by the international community at large. The contribution made in the past in the field of forestry, through education, research, transfer of technology, investment and commerce, and in social and governance aspects, has been of major importance.

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<sup>65</sup> [www.unu.edu/env/forests/WFSExecutive-summary.pdf](http://www.unu.edu/env/forests/WFSExecutive-summary.pdf)



The concern of this submission is that this capacity to support the contribution of the forest sector to development, in which the United Kingdom has such valued potential, should be maintained and enhanced. The Department for International Development has the pivotal roles of stimulating appropriate capacity within the United Kingdom and facilitating its dissemination to developing countries.

November 2003

## APPENDIX 58

### Memorandum from the Research Councils UK

#### INTRODUCTION

1. Research Councils UK (RCUK) is a strategic partnership set up to champion the research, engineering and technology supported by the seven UK Research Councils. Through RCUK the Research Councils are working together with the Arts and Humanities Research Board (AHRB) to create a common framework for research, training and knowledge transfer. RCUK was launched on 1 May 2002 and further details are available at [www.rcuk.ac.uk](http://www.rcuk.ac.uk)

2. The RCUK Strategy Group leads this partnership and is chaired by the Director General of the Research Councils. The members are the Research Councils' Chief Executives and the AHRB Chief Executive attends meetings as an observer.

3. RCUK welcomes the opportunity to respond to the House of Commons Science and Technology Committee inquiry "The use of science in UK international development policy". This memorandum is submitted by Research Councils UK on behalf of five of the Research Councils, and represents our independent views. It does not include or necessarily reflect the views of the Office of Science and Technology.

4. The submission is made on behalf of:

Biotechnology and Biological Sciences Research Council (BBSRC) Annex 1

Economic and Social Research Council (ESRC) Annex 2

Engineering and Physical Sciences Research Council (EPSRC)<sup>66</sup>

Medical Research Council (MRC) Annex 3

Natural Environment Research Council (NERC) Annex 4

#### RCUK RESPONSE TO QUESTIONS

A. *The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID.*

5. All Research Councils, with the exception of CCLRC and PPARC, contribute to the science base for international development, and to the training of scientists and technicians from developing countries. The Research Councils agree with the DFID focus on achievement of the Millennium Development Goals, and with an emphasis on capacity building and decision making in developing countries. However, we also point to the need to sustain a core of expertise in development related science within UK Universities and Institutes, and to the need for greater effort to stimulate and facilitate partnership between UK scientists and counterparts in developing countries.

6. All Councils support research and postgraduate training for the benefit of the UK science base, and have a principle role in focusing on the prosperity and well-being of the UK population. While pursuing excellent science and this focus, they contribute to the needs of the departments listed above. Four of the Councils have recently met with DFID to consider how trends and developments in developing countries may inform requirements for research from the UK science base. Some of the Research Councils and component Institutes have also contributed to a recent DFID consultation on "key researchable ideas."<sup>67</sup>

7. The International Sections of the Research Councils come together under the RCUK International Group (RCUK-Int), which also involves OST SEB (Science and Engineering Base) and OST International. The five Councils contributing to this submission promote links between their communities and scientists in developing countries. These links include projects dedicated to issues which are uniquely important in developing countries or regions, but they also include projects on issues which are of mutual benefit to both developed and developing countries, for example impacts of climate change or disease. Mechanisms for collaboration include:

<sup>66</sup> EPSRC have contributed to the RCUK submission, however have not provided an Annex.

<sup>67</sup> [http://www.dfid.gov.uk/PolicyAndPriorities/knowledge/research\\_invite.htm](http://www.dfid.gov.uk/PolicyAndPriorities/knowledge/research_invite.htm)

- 
- supporting research collaboration through international visits, workshops and research grants to foster and deepen links between researchers and between countries;
  - contributing to international science policy and programmes and ensuring that priorities in these programmes (eg EU Framework Programmes) reflect the interests and needs of developing countries;
  - jointly seeking funding sources for international collaboration, where the UK partner has more knowledge of international opportunities;
  - developing strategic relations with counterpart organisations overseas and with OST, FCO, British Council, DEFRA and DTI to promote scientific interactions for mutual benefit; and
  - promoting international awareness of successful partnerships between UK institutes and developing country partners.
8. The following Research Council activities are relevant to International Development Policy:
- (a) BBSRC research has direct relevance to challenges in developing countries. Genes for salt-tolerance in crops have been identified and used as tools for screening varieties in breeding programmes; research has identified what triggers locusts to swarm and provide advance warning of where they may strike; crops have been modified to include resistance to attack from nematode worms; grass-intercropping systems have been developed for maize in Kenya to induce pests to lay eggs on the grass and not the maize; novel vaccines have been developed for rinderpest and caripox; and progress made in understanding the molecular basis of resistance of swine-fever to the natural defence systems of the animals it infects.
  - (b) ESRC has built a very strong UK capacity for social and economic research of relevance to developing countries. The portfolio includes major investments which focus on the developing world, but development is also “mainstreamed” within broader research agendas. Supported investments include the Group on Wellbeing in Developing Countries, the Global Poverty Research Group, the Centre on Migration, Policy and Society, the Centre for the Study of Globalisation and Regionalisation, the Business Relationships, Accountability, Sustainability and Society Centre, the Environment and Human Behaviour Programme, the Centre for Social and Economic Research on the Global Environment, New Security Challenges Programme, the Future Governance Programme, Science in Society Programme and the ESRC Genomics Network. These investments alongside responsive mode research funding and the support of postgraduate research training for work in developing countries, ensure that the ESRC makes a broader contribution in supporting collaborations between UK social scientists and scientists in developing countries.
  - (c) The principles of sustainable development inform and shape many of EPSRC’s research programmes. As an example, EPSRC’s Infrastructure and Environment Programme has an explicit quality of life focus and supports research relevant to the sustainable development agenda. While EPSRC research is focussed on the needs of the UK it is likely that some of its supported research, for example in energy, transport, urban development and waste minimisation, offers the potential for adaptation in a development context. The multinational character of many of the companies collaborating in EPSRC-funded research in areas such as water management and waste treatment provide one example of opportunities for direct knowledge transfer to the developing world. In addition a new scheme “Interact” has been established to encourage new collaborations with China, India and Japan by supporting trips by individuals or groups and bilateral workshops.
  - (d) MRC has pioneered important medical research relevant to the health of those in developing countries since its inception in 1913. It has funded research in developing countries since the 1920s. Since 1936, there has been a coherent research strategy, with substantial investment and high quality science. This has resulted in major contributions to knowledge, and has benefited the health and wealth of people living in deprived circumstances. MRC experience in sustained relationships with countries, researchers, governments and policy makers has helped ensure the relevance of research, and provide a substantive platform with which to build future constructive relationships. The largest investments have been at the MRC Laboratories in The Gambia (since 1948), the MRC Programme on AIDS in Uganda (since 1987) and, between 1974–99, the MRC Laboratories in Jamaica. (In 1999, the Laboratories were renamed the Sickle Cell Unit and are part of the newly established Tropical Medicine Research Institute (TMRI) within the University of the West Indies) MRC Gambia and MRC Uganda both receive direct support and between them employ over 1,000 local and international staff. Both Units are able to supplement their core income with grants awarded from other organisations including NIH, WHO and the EU.
  - (e) NERC’s British Geological Survey (BGS) has a long history of institutional strengthening and research for development in the groundwater, minerals, energy and hazards sectors. NERC’s Centre for Ecology and Hydrology (CEH) carries out research in water resources, global climate modelling and optimisation of tropical landuse. NERC’s Proudman Oceanographic Lab have developed equipment and training for developing countries to monitor sea-levels and coastal resources. The Plymouth Marine Lab, have undertaken studies of tropical marine resources for DFID and other agencies.

9. DEFRA is not included in the Departments listed the Committee's question above. However, favourable mention should be made of DEFRA's "Darwin Initiative for the Survival of Species", which has recently had its budget increased to £7 million per annum. The Darwin Initiative focuses on helping developing countries meet their commitments under the Convention for Biological Diversity (CBD). It has an excellent reputation for developing linkages between UK scientists, local counterparts and NGOs, and successfully combines an emphasis on applied science with poverty alleviation. It is suggested as a potential model for UK programmes in other areas<sup>68</sup>.

10. Only by supporting the development of local capacity in developing countries can those countries compete effectively in world trade and secure local benefits. We feel that greater coordination between DFID, DTI, FCO, DFES, DEFRA, the HEI sector, NGOs, charities and other aid agencies/development banks would be highly beneficial. This approach, however, necessitates regular synthesis of policies to inform the direction of science policy. Advice from DFID on how Research Councils could align domestic science programmes so that outputs can inform strategic collaborations would be welcome, and is the subject of current dialogue between Research Councils and DF OST -ID.

*B. The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

11. The Research Councils have differing relationships with DFID. MRC have a Concordat involving annual meetings and DFID makes a contribution of £4 million per year towards the £23 million per year of their overall research budget which is identified as relevant to International Development. Recent DFID-NERC contact has been limited but until 1999 regular bilateral meetings were held and the DFID senior Natural Resources Advisor sat on NERC's Resource Strategy Group. BBSRC, EPSRC and ESRC have held recent meetings with DFID with the objective of strengthening future relationships, and BBSRC-sponsored institutes have regularly performed applied research projects for DFID (£1.4 million in 2001–02).

12. The Surr Report on "Research for Poverty Reduction"<sup>69</sup> recommended to DFID that contact with the UK Research Councils should be strengthened. DFID subsequently contracted RAND International to identify options for closer collaboration with Councils and other UK organisations<sup>70</sup>. RAND recommended establishment of an International Development Research Funders' Forum, modelled on the Environment Research Funders' Forum which is chaired by NERC.<sup>71</sup> The Research Councils welcome the opportunity for regular contact with DFID, whether it is in the form of a combined forum, or individual concordats.

13. DFID has undergone, and is still undergoing, considerable reorganisation of its research programmes. This has caused previously placed contracts to be cancelled and links with "Resource Centres"<sup>72</sup> to be suspended. Over-rapid suspension of the Knowledge and Research Programmes, which gained excellent reviews from independent consultants, has been unfortunate. However Councils look forward to the new schemes which emerge from DFID's latest review and trust that the high standards for delivery of research outcomes of previous schemes will at least be maintained in the new arrangements.

14. MRC and DFID, as part of their Concordat, jointly monitor a portfolio of research relevant to developing societies currently worth about £23 million in 2002–03, of which DFID contributes £4 million. Much of this research is relevant to the UK population, for example work on TB, AIDS, reproduction, contraception, vaccine technology, sickle cell disease, and nutrition. Direct support of £14 million a year is allocated to MRC Units and Institutes, indirect support of £8.7 million a year is allocated through grants to universities (further details in Annex 3). In addition, recently, the MRC has started to support work on Severe Adult Respiratory Syndrome (SARS) and has signed a Memorandum of Understanding with the Beijing Public Health Bureau.

15. DFID's health programme has had much greater continuity. Health services and public health research are important areas of MRC's portfolio; however, translating research in tropical medicine into public health policy in developing countries is less easy to justify when there are pressures on resources in the UK, and when translation *per se* is "Development" rather than "Research". It is particularly in this area that there is synergy between the interests of the Department for International Development and the MRC. The White Paper "Eliminating World Poverty: a challenge for the 21st century"<sup>73</sup> and the International Development Target Strategy Paper "Better Health for Poor People"<sup>74</sup> re-emphasise the importance of health and population research as part of development aid.

<sup>68</sup> <http://www.darwin.gov.uk>

<sup>69</sup> [http://62.189.42.51/DFIDstage/Pubs/files/Res\\_pov\\_red.htm](http://62.189.42.51/DFIDstage/Pubs/files/Res_pov_red.htm)

<sup>70</sup> [http://62.189.42.51/DFIDstage/Pubs/files/research\\_national\\_study—1.pdf](http://62.189.42.51/DFIDstage/Pubs/files/research_national_study—1.pdf)

<sup>71</sup> <http://www.erff.org.uk/>

<sup>72</sup> In the water sector, OASIS is a Resource Centre sponsored by DFID and led by CEH, BGS and HR Wallingford Ltd. OASIS works in partnership with DFID, other donors, UN Agencies, developing country governments, NGO's and other stakeholders to provide expertise in water resources issues. This expertise is drawn from the OASIS network of organisations which include private sector companies. It has the potential to be a vehicle for greater private sector involvement. OASIS should provide a range of services to help create, access, share and use knowledge with those involved in the water resources sector. These services are focused upon helping DFID and its partners to deliver the Millennium Development Goals. Unfortunately, activity is currently stalled as a result of DFID's reorganisation.

<sup>73</sup> <http://www.eldis.org/static/DOC8708.htm>

<sup>74</sup> [http://www.dfid.gov.uk/Pubs/files/tsp\\_health.pdf](http://www.dfid.gov.uk/Pubs/files/tsp_health.pdf)

16. The MRC takes a particular interest in the activities of DFID's Knowledge Programmes in the areas of HIV, Malaria and Tuberculosis. The programmes have capitalised on the strong links between the programme managers to establish very close working relationships between the programme teams. The HIV/AIDS STI Programme for example is based at the London School of Hygiene and Tropical Medicine and the MRC Social and Public Health Sciences Unit (SPHSU) and brings together research programmes from over 20 developing countries.

17. The Research Councils are developing a number of priority themes in the context of Spending Review 2004. Some of these include research relevant to international development research: eg conditions for life, systems biology, infectious diseases, changing ourselves and personal and national security. Other themes focus on UK issues but provide useful knowledge and tools that can be transferred to the development context.

*C. The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes*

18. DFID's bilateral programmes rightly place emphasis on fulfilling local Poverty Reduction Strategies<sup>75</sup> and Country Strategy Papers<sup>76</sup>. This emphasis places a high demand on "local" research to provide the evidence on which to build poverty reducing strategies and to determine what works during implementation. This approach requires that the strategies are owned and developed by people in developing countries in partnership with researchers from developed countries who are aware of local conditions. They are less successful if driven by the agendas of foreign advisors and officials from development agencies. The Surr Report<sup>77</sup> indicated that £33.3 million was spent by DFID's country and regional programmes on research and policy analysis, but could not find information to distinguish between these categories. As a "knowledge based" organisation DFID could more effectively and profoundly embed a consideration of research needs into its operational systems and procedures. For example, by ensuring that its Country Strategies routinely consider what gaps there are in research if poverty objectives are to be met.

19. Two-way links should exist between central and regional strategic research and country bilateral programmes. An excellent example from the 1990s of investment by a country programme is the series of ODA/DFID-funded projects from the Zimbabwe country office. These projects allowed the NERC's CEH and BGS to pioneer the use of innovative collector wells, coupled to community-managed, irrigated gardens (Productive Water Points). These gardens were shown to create a positive spiral of wealth generation. It is not certain that this type of "appropriate-technology" project is being funded at present.

20. It is possible that DFID's rigid adherence to a three-year Country Strategy Paper may impede commissioning of necessary research. A contemporary example is the recent discovery of serious landslips in Maputo, Mozambique, that threaten nearby residential tower blocks and consequently human life. However, the Mozambique Strategy does not address these aspects of geohazards and its inherent inflexibility, together with DFID's reluctance to involve expert input, may prevent meaningful action.

21. We recommend that DFID should, as a matter of course, ensure that the both the national and international research communities, as well as civil society groups, should contribute to the development of Country Strategy Papers from their earliest stage. We also recommend that the research community is commissioned to participate actively throughout the execution phase of each plan, so that it can be applied flexibly and appropriately as circumstances develop.

22. At country level DFID can also increase its engagement with the international development programmes of the International Agencies, the European Union and its European Partners. There is considerable scope for pooling of resources and assessments of research requirements, particularly in the identification of effective developing country partners.<sup>78</sup>

23. In the field of health research, DFID has taken a lead in "Getting Research into Policy and Practice" and supports the dissemination of information through support of the ID-21 web site ([www.id21.org](http://www.id21.org)) hosted by the University of Sussex. There are many examples where the outcome of MRC-funded research has led to changes in policy and practice at the individual country level. These include (see Annex 3):

- The introduction of new vaccines into country vaccine programmes;
- The use of insecticide-impregnated bednets to protect against malaria;
- The introduction of new drugs (eg Nevirapine) into standard healthcare;

<sup>75</sup> The Poverty Reduction Strategy Process is shared by many development agencies. The World Bank, for example, indicates that the Process should be: a) country-driven—involving broad-based participation by civil society and the private sector in all operational steps; b) results-oriented—focusing on outcomes that would benefit the poor; c) comprehensive in recognizing the multidimensional nature of poverty; d) partnership-oriented—involving coordinated participation of development partners (bilateral, multilateral, and non-governmental); e) based on a long-term perspective for poverty reduction. (<http://www.worldbank.org/poverty/strategies/overview.htm>).

<sup>76</sup> [http://www.dfid.gov.uk/main\\_content.htm](http://www.dfid.gov.uk/main_content.htm)

<sup>77</sup> [http://62.189.42.51/DFIDstage/Pubs/files/pov\\_red\\_pol\\_paper.pdf](http://62.189.42.51/DFIDstage/Pubs/files/pov_red_pol_paper.pdf)

<sup>78</sup> DFID's Civil Society Programme, and similar programmes supported by other EU member states, works in partnership with International NGOs and local NGOs and Community Based Organisations, and frequently identifies applied research needs. There is a need for pooling of information (perhaps coordinated by the local EU Delegation) on which developing country partners are effective, and using these civil society organisations to identify research needs and priorities.

- The wide distribution of condoms (often free) to protect against HIV infection; and
- The use of food supplements for undernourished babies.

*D. The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes.*

24. Research Councils do not undertake activities specifically to help developing countries overcome trade restrictions. We are aware of trade stabilisation schemes for ACP countries supported by successive rounds of the Lome Convention (€4.6 billion under the five-years of Lome IV)<sup>79</sup>. Applied research is a valid use for a proportion of these funds. However the ESRC does support a range of research which directly explores the issues behind developing country participation in international trade and in relation to new trade rules (Globalisation Centre, the forthcoming programme on World Economy and Finance).

*E. The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced.*

25. Research Council institutes receive funding not only from DFID, but from a number of International and National Development Agencies (eg Asian Development Bank, African Development Bank, UN Development Programme, USAID, Development Studies Association of UK and Ireland), charitable trusts (eg Gatsby Charitable Foundation, Rockefeller Foundation, Winrock Foundation, Bill and Melinda Gates Foundation) private sector agencies (eg Shell, Unilever GlaxoSmithKline, Wyeth Lederle) or International Programmes (EU, UNESCO, UNEP, WHO, IAVI).

26. The importance of knowledge transfer is in the long-term self interest of many parts of the UK private sector, in that markets are created in developing countries for their products and services. Many African countries face the problems of a low technology/education base and decimation of the few highly educated and skilled people from HIV/AIDS. In South Africa, the new Minerals and Petroleum Resources Development Act, Mining Charter, Money Bill and Beneficiation Bill will require large numbers of South Africans to be trained and receive technology transfers. Some of the benefits of this, such as renewed mining licences, supplies of equipment and consultancy, will flow back to UK based industries. There is a role for the Research Councils and UK universities to work with UK industry and overseas governments to support such knowledge transfer.

27. The MRC works closely with the private sector, particularly pharmaceutical companies, in certain specific topics in developing countries. These are mainly clinical trials of vaccines or drugs, where the product (plus any placebos or controls) is provided by the manufacturer(s), and the other resources are provided by the MRC, often in conjunction with other funders. Examples in recent years have included trials of vaccines for malaria, hepatitis B, Haemophilus influenzae, and Pneumococcus, and the ongoing trial of virucides to prevent HIV transmission. Not all of the companies concerned are UK-based; the MRC will form partnerships with those companies best placed to meet its needs and those of the developing country. This type of partnership can best be enhanced by effective communication between all the parties involved, which is often very complex, especially where regulatory agencies are also involved. A specific problem is the “gap” between the products or outcomes of academic researchers and what a company will need in order to invest in developing that product for the high risk endeavour of a clinical trial. For diseases that predominantly affect poorer populations, the company may not see a market that will allow it to recoup its substantial R&D costs. In these cases, the public funder(s) have additional responsibilities to support research and other activities that may lead to new treatments.

28. NERC’s BGS, through work commissioned by the World Bank, is involved in several capacity building projects in developing countries. For many such countries, the only viable, long-term, sustainable way out of poverty is through the development of natural resources, predicated on effective capacity in licensing and regulating the activities. The importance of this work as a contributor to good governance, education and economic development is well recognised by the World Bank and several European aid agencies (the Nordic Development Fund, DANIDA, Coopération Française, etc).

29. Clarification is needed on DFID’s interpretation of the International Development Act (2002)<sup>80</sup>. Whilst it is not DFID’s responsibility to guarantee support to overseas research agencies in the UK, it is necessary to consider whether it is in the interests of the UK and our long-term capacity to deliver aid, that a minimum national level of overseas technical expertise is maintained.

<sup>79</sup> Eg STABEX which assures monetary transfers to exporters of primary products when their effective earnings from one year exports to the EU fall below the average earnings of the previous year four years and SYSMIN which is a scheme providing aid for the rehabilitation of mining operations.

<sup>80</sup> See [www.dfid.gov.uk/policiesandpriorities/ida/ida\\_main.htm](http://www.dfid.gov.uk/policiesandpriorities/ida/ida_main.htm). The 2002 Act stipulates two conditions which must both apply: a) assistance is provided for the purpose of furthering sustainable development or improving welfare, and b) that DFID is satisfied that the assistance will be likely to contribute to the reduction of poverty. It does not specifically stipulate that aid tendering must be opened worldwide.

*F. The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

30. Most Councils assist visiting scientists and students from developing countries to acquire skills relevant to their home countries. These include projects which have been supported under the aegis of the United Nations, the European Union and the World Health Organisation, as well as UK and overseas governments. In addition to supervision of research students from overseas, Research Council supported researchers take part in a wide range of international conferences and workshops.

31. The BBSRC-sponsored Institute Rothamsted Research, has an independent offshoot Rothamsted International which operates a small charity bringing scientists from developing countries to the UK for agricultural research training and experience that will improve the sustainability of agriculture in their home country. The BBSRC-sponsored Institute of Animal Health also provides a number of training courses, mostly aimed at equipping groups of scientists from developing countries with the techniques necessary for the implementation of disease control and surveillance programmes. These courses are held both within the Institute and abroad.

32. All NERC projects aim to build capacity by working with developing country national institutions. They provide training, at all levels, through on-the-job experience in the whole spectrum of research from project planning, to writing up and dissemination of the results. Projects are most successful when repeat funding allows work with one institution for a long period. Long term, institutional strengthening is more effective than training individuals on a project by project basis. Current examples from the NERC-BGS include technical training in minerals information systems (Mozambique, African Development Bank, funded); field mapping and database/GIS building (Mauritania, World Bank funded), training in geophysics and satellite image interpretation (Papua New Guinea, World Bank funded), including in earth observation techniques offered by the NERC Earth Systems Science Centre at Reading.

33. The ESRC supports a range of research activities which engage with scientists in developing countries. The Wellbeing in Developing Countries Research Group for example currently is carrying out collaborative research with research organisations across four developing countries. Other ESRC Research Centres have systematically engaged with researchers from Developing Countries over a considerable number of years (Centre for Study of African Economies, Globalisation, GEC).

34. Urgent training of a large number of water resource professionals and technicians will be needed if the Millennium Development Goal<sup>81</sup> of reducing by half the proportion of people without access to safe drinking water requires is to be met by 2015. NERC's Centre for Ecology and Hydrology has initiated and participated in UNESCO training programmes including Flow Regimes from International Experimental and Network Data (FRIEND) and Hydrology for the Environment, Life and Policy (HELP), and in the World Meteorological Organisation's Hydrological Operational Multipurpose System (HOMS), which is a network aiming to build capacity and international measurement standards by disseminating training material for hydrology from developed to developing countries. CEH is the UK National Reference Centre for HOMS, but DFID funding for this ended in 2001.

35. While it is not formally part of "development policy", the MRC supports scientific training in developing countries. This is through income from a private bequest—the "Rogers Fund"—made to MRC in 1925, to support research training in tropical medicine carried out in former British Territories and Commonwealth Countries. Since 1997, the Fund has been used to train local staff involved in MRC research Units overseas. The scheme is aimed at local trainee researchers or technicians either embarking on research/technical training for the first time or more experienced individuals who wish to acquire more specialist skills. The scheme is currently being reviewed to see whether the funds can be more effectively used to develop a credible professional development pathway linking the developmental needs of individuals to those of the overseas Units. In addition, on-the-job training is provided in all MRC's overseas Units, which have structures that enable local staff to develop their careers locally. While there are real concerns about "brain-draining" scientists from developing countries, it may be best for the developing country if its nationals spend quite extended periods in developed countries. Even when not residing in their own country, such people are not lost to it: their research and continuing interactions can bring substantial benefits.

36. The Chief Scientific Advisor (CSA) has recently announced the "Dorothy Hodgkin Postgraduate Awards" to provide support for PhD scholarships for students from developing countries to train in the UK, with the expectation that most will return to their own countries. The first intake in October 2004 will provide fully funded scholarships for over 100 students. Joint funding will be provided by Government and the private sector. All of the Councils have welcomed the scheme in principle, and are discussing how best to participate. Subject to certain requirements being met, the MRC has agreed to support the new scheme at a maximum of £150,000 per annum for three academic years, in the first instance. Both EPSRC and NERC have each agreed to support an initial cohort of up to 20 studentships with a total expenditure of £4 million. ESRC has agreed to provide ten studentships with a total expenditure of £700,000. BBSRC has agreed to provide support for half the costs of ten scholarships for academic year 2004–05, at an annual cost of £120,000, given that matching funds are being provided. Other Councils are considering their support for the scheme.

*November 2003*

<sup>81</sup> <http://www.undp.org/mdg/>

## Memorandum from the Biotechnology and Biological Sciences Research Council

### INTRODUCTION

1. BBSRC funds scientific research through two main routes: responsive research grants to UK universities and core strategic funding to eight BBSRC-sponsored research institutes and Horticulture Research International. BBSRC does not fund research projects in universities or institutions situated in developing countries, but much of the research we fund in the UK, especially in the areas of agriculture and management of natural resources is taken forward by researchers and their institutions with contacts in developing countries. BBSRC-sponsored Institutes collaborate with developing countries, often in association with national or international funding agencies. BBSRC provides support to grant holders in the UK for initiating and developing collaborative activity, in order to help access funding opportunities available. BBSRC interactions with DFID are currently focused on developing a greater awareness of DFID policies to inform BBSRC science priorities. One current example is input from DFID to BBSRC's review of crop science.

### RESPONSES TO QUESTIONS

A. *Co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

2. BBSRC supports research and postgraduate training for the benefit of the UK science base. However, the portfolio of science that we fund is shared with the above Departments through making available details of research funded and also advising on UK expertise in specific areas of research. BBSRC agrees with the direction of international development policy towards capacity building in developing countries and the trend in decision making to be centred in those countries.

3. BBSRC is now taking forward with DFID how trends and developments across developing countries may inform what might be needed from the UK science base in order to deliver development objectives.

4. BBSRC promotes international links both at the policy level and practically between individual scientists in order to make the most of new scientific opportunities, to explore ways of sharing knowledge and technology for mutual benefit, and to exploit funding opportunities. The Mission of BBSRC's International Relations Unit (IRU) is to integrate the international dimension to BBSRC research and policy development for the benefit of Council and the BBSRC Community. Core activities under the current strategy to realise these aims include:

- Supporting research collaborations through a variety of mechanisms including international visits, workshops and research grants to foster and deepen links between researchers and between countries;
- Contributing to international science policy;
- Ensuring priorities in international programmes offer appropriate opportunities for the BBSRC community, especially the EU Framework Programmes;
- Providing advice on these and other opportunities and funding sources for international collaboration, through IRU and as managing partner of UKRO;
- Developing strategic relations with counterpart organisations overseas and with OST, FCO, British Council, DEFRA and DTI to promote scientific interactions to BBSRC and UK benefit.
- Promoting international awareness of UK strengths in science and science policy development.

5. Since its establishment in 1994, BBSRC has provided travel funds for grant holders and researchers at BBSRC-sponsored Institutes to initiate and develop collaborative activity. Although most of this activity is with USA, Canada, Japan and EU countries, travel funds (spend to date) have been provided for activities with Asia (£119k); Latin America (£37k) and Africa (£11k).

6. BBSRC research has direct relevance to challenges in developing countries. Some examples of such work that has been taken forward are given below. These interactions have been supported by BBSRC (through our travel awards), DFID and other sources of funding such as the Gatsby Charitable Foundation and international bodies such as the UN Development Programme.

7. Salt Tolerant Cereals: In developing countries, agricultural land affected by salt means that the development of salt tolerant crops is the only viable alternative to reclaiming such land, which is prohibitively expensive. A particular problem is the water used in irrigation systems contains large quantities of dissolved salts. BBSRC funded research at the University of Sussex has identified genes involved in salt tolerance in plants, and these genetic markers are being used as tools in screening for salt tolerance in breeding programmes. Two new salt-tolerant rice varieties have been released in the Philippines. This work at Sussex is now linked to the cereal mapping programmes at the John Innes Centre. There are now well-documented problems of excessive soil salinity in parts of the USA and Australia.

8. Pest control—locusts: Swarms of locusts can consume hundreds of thousands of tonnes of vegetation per day. However for most of the time a locust exists in a solitary forms up to 2km from its neighbour. BBSRC research at the University of Oxford is identifying what it is that triggers locusts to switch from solitary to gregarious forms (swarms) and subsequent molecular processes. One outcome could be better advance warning of where and when locust swarms might strike. The team has also found at least one of the mechanisms by which female locusts ensure that their eggs develop into gregarious individuals. This is also a topic on the BBSRC “Life” website, offering on-line exhibitions exploring the science and issues of modern biological research<sup>82</sup>.

9. Pest control—nematode worms: Nematode worms in soil cause crop losses worldwide worth about \$100 billion (1998 figures), and the chemicals used to control them are amongst the most environmentally damaging of all pesticides as well as being carcinogenic and costly. Research funded by BBSRC at the University of Leeds uses genetic modification to produce crops capable of resisting attack by nematodes. The plan is to introduce into susceptible species, a gene that occurs naturally in some varieties of rice, which codes for a protein that prevents nematode worms from digesting their food properly. Amongst the applications already being considered for long-term development are nematode-resistant upland rice in West Africa, and nematode resistant bananas in the Windward Islands. Collaborations have been established with groups in Hawaii, Bolivia, St Lucia, Cote d’Ivoire and the Philippines as well as with the John Innes Centre in Norwich.

10. Pest control—stem borers: Researchers at Rothamsted Research (a BBSRC-sponsored Institute) are intercropping two grass species amongst maize in Kenya to act as traps attracting pests to lay eggs on them and not the maize. Further, a perimeter of two resistant plants around the maize field which repel adult stem borers underwent trials at the field station of the Kenyan Agricultural Research Institute at Kitale, and is producing excellent results. BBSRC has funded further meetings since these field trials, and the Gatsby Charitable Foundation is now funding further research. BBSRC has also sponsored meetings in Ethiopia to promote wider exploitation of these techniques. As a result, on-farm investigations were carried out in Ethiopia, Uganda and Tanzania and results presented to the Rockefeller Foundation and the United Nations.

11. Animal disease: Rinderpest and capripox are important diseases of cattle, sheep and goats in Africa, the Middle East and Asia. Research at the BBSRC-sponsored Institute for Animal Health Pirbright Laboratory aims to design novel vaccines to control these diseases. Vaccine trials have been carried out in animal containment facilities in Kenya on local Kenyan cattle, sheep and goats. Other work at the Institute includes elucidating the molecular basis to the success of the African swine fever virus in evading the natural defence systems of the animals it infects. This better understanding of the role of individual genes of the virus should aid the design and development of safe and effective vaccines.

*F. The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries*

12. BBSRC-supported scientists contribute to a range of research training activities aimed at developing skills for the future. These include projects which have been supported under the aegis of the United Nations, the European Union and the World Health Organisation, as well as UK and overseas governments. In addition to supervision of research students from overseas, BBSRC supported researchers take part in a wide range of international conferences and workshops.

13. An independent arm of Rothamsted Research, Rothamsted International, operates a small charity bringing scientists from developing countries to the UK for agricultural research training and experience (based at Rothamsted) that will improve the sustainability of agriculture in their home country<sup>83</sup>.

14. The Institute of Animal Health provides a number of training courses, mostly aimed at equipping groups of scientists from developing countries with the techniques necessary for the implementation of disease control and surveillance programmes. These courses are held both within the Institute and abroad<sup>84</sup>.

## Annex 2

### Memorandum from the Economic and Social Research Council

#### INTRODUCTION

1. The scope of the social sciences is international. They transcend national boundaries and nation states in their methods and subjects of enquiry, and in the knowledge which they produce. The Council strongly believes that research in the social sciences flourishes in an open and internationalist perspective. Given increasing awareness of processes of globalisation, it is apparent that in social, economic and political terms the well-being of developed and developing countries are increasingly interdependent. The ESRC will consider support for research covering any part of the world within our normal funding schemes.

<sup>82</sup> [www.bbsrc.ac.uk/life/crowd/index.html](http://www.bbsrc.ac.uk/life/crowd/index.html)

<sup>83</sup> [www.rothamsted.bbsrc.ac.uk/ri/ri.htm](http://www.rothamsted.bbsrc.ac.uk/ri/ri.htm)

<sup>84</sup> [www.iah.bbsrc.ac.uk/primary\\_index/jobs\\_and\\_training/Training.html](http://www.iah.bbsrc.ac.uk/primary_index/jobs_and_training/Training.html)



2. The ESRC funds work both on, and in, the developing world, and also work on social and economic studies of science and technology. The ESRC considers its portfolio of development related investments to be a vital contribution to economic competitiveness, public policy and quality of life in the UK. The following are examples of major investments of particular relevance to this enquiry.

#### RESPONSES TO QUESTIONS

A. *The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

3. The ESRC has built a very strong UK capacity for social and economic research of relevance to developing countries. The portfolio includes major investments which specifically focus on the developing world, but development is also “mainstreamed” as an aspect of broader research agendas.

#### *Developing World investments*

4. The Research Group on Wellbeing in Developing Countries<sup>85</sup> (£2,851,948) at the University of Bath has a current research programme which aims to develop a coherent conceptual and methodological framework for understanding the relationships between poverty, inequality and quality of life in specific developing countries. The conceptual framework and methodology is being developed and tested in detailed studies with collaborating research organisations in Bangladesh, Ethiopia, Peru and Thailand. Its conclusions however will seek to offer insights relevant to policy efforts for the reduction of poverty in all developing countries.

5. The Global Poverty Research Group<sup>86</sup> (£2,517,531) at the Universities of Oxford and Manchester aims to extend understanding of how poverty can be best understood and reduced using a variety of disciplinary and methodological approaches. The research themes of the Group are: a) poverty, intra-household allocation and well-being; b) income opportunities, inequality and the poor; c) human capital, institutions and well-being; d) social capital, the provision of public services, and social safety nets; and e) governance, social norms and social outcomes.

6. Both of these research groups have had and continue to enjoy a good deal of interaction with DFID and as such they represent one important means of connecting the ESRC with thinking in DFID.

7. The Centre on Migration, Policy and Society<sup>87</sup> (£3,320,459) at the University of Oxford provides a strategic, integrated approach to understanding contemporary and future migration dynamics across sending areas and receiving contexts. Projects highlight the connections of migration to development, globalisation, governance, and human rights.

8. The Centre for the Study of Globalisation and Regionalisation<sup>88</sup> (£2,166,375) at the University of Warwick investigates issues of the definition, measurement, impacts, and policy implications of globalisation and regionalisation. More specifically, much of the Centre’s research concentrates on questions such as international financial crises, multijurisdictional tax competition, the development of global and regional governance institutions, social policy issues in globalisation, social movement resistance and other civil society activities regarding globalisation, and the implications of globalisation for international security. CSGR research spans all regions of the world, as well as relations between them.

9. ESRC has also funded a number of response mode grants which has had particularly good links with the Health and Population section at DFID. ESRC believes that this section undertook extremely good work in an important policy area.

#### *Other Investments of Relevance to Development and Science and Technology*

10. The Business Relationships, Accountability, Sustainability and Society Centre<sup>89</sup>, University of Cardiff, which exists to understand, promote and “mainstream” the key issues of sustainability, accountability and social responsiveness, through research into key business relationships. Research from the new BRASS centre has already led to the publication of a book analysing the use of organic and agro-ecological farming techniques among less industrialised countries.

11. The Environment and Human Behaviour Programme, Policy Studies Institute<sup>90</sup>, which is a new ESRC programme aiming to identify and develop new directions, theories and methods in environmental social science research. Research includes issues associated with environmental change affecting indigenous cultures, environmental values in developing countries and the vulnerability of food systems.

<sup>85</sup> [www.welldev.org.uk](http://www.welldev.org.uk)

<sup>86</sup> <http://www.gprg.org>

<sup>87</sup> [www.compas.ox.ac.uk](http://www.compas.ox.ac.uk)

<sup>88</sup> <http://www.warwick.ac.uk/csgr/>

<sup>89</sup> <http://www.brass.cf.ac.uk>

<sup>90</sup> [www.psi.org.uk/ehb](http://www.psi.org.uk/ehb)

12. The Centre for Social and Economic Research on the Global Environment<sup>91</sup> at the University of East Anglia, which is dedicated to original research on the causes, consequences and policy implications of global environmental change. It focuses on policy issues, using interdisciplinary research which bridges the natural and social sciences. Research includes the empowerment of local groups in ecosystem management, environment and human development and the planning and implementation of climatic change adaptation projects.

13. The New Security Challenges Programme<sup>92</sup> which focuses on international security but defined broadly to include threats to groups as well as nations; to the biosphere as well as the polity, and from military to political, economic and environmental security.

14. The Future Governance Programme<sup>93</sup> at LSE which is concerned with lesson drawing in public policy and policy transfer. These address key questions about the circumstances under which cross-national lessons are sought, the conditions under which policies can be transferred, how the process of transfer works and the political, social, economic and cultural variables that affect how lessons drawn from experiences in one jurisdiction can be applied in another. It will provide specific lessons for policy development in fields across the range of government services and generate broader insights into how innovations developed in one country may be adapted to work successfully in other jurisdictions. Projects of particular relevance to this initiative look at health, the environment, and maximising the reconfiguration of development agencies.

15. The Science in Society Programme at the University of Oxford<sup>94</sup> which aims to explore and facilitate the rapidly changing relations between science (including engineering and technology) and wider society. In so doing, it seeks to place British social science at the heart of international debates and practical interventions concerning the public understanding of science, science and technology policy, science studies, and the nature of citizenship and expertise within contemporary society. Relevant projects under this initiative include global solutions to combat water scarcity, childhood vaccination in Africa, and agricultural biotechnology partnership programmes between the developed and developing world.

16. The ESRC Genomics Network has three Research Centres, each with a global dimension:

- The Centre for Economic and Social Aspects of Genomics<sup>95</sup> at the University of Lancaster includes an investigation of indigenous peoples throughout Amazonia and wider institutions with regards to the exploitation of indigenous ecological knowledge.
- The Centre for Social and Economic Research on Innovation in Genomics<sup>96</sup> University of Edinburgh has two relevant projects which explore (and seek to improve) knowledge and technology flows between developers and user groups in Latin America, Asia, and Africa.
- The Centre for Genomics in Society<sup>97</sup> at the University of Exeter, has interests in the implications of international intellectual property law for agricultural change in developing countries.

*F. The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

17. Research Grants: The ESRC currently invests approximately £3 million in grants and fellowships that investigate various social science issues within the developing world. These issues are diverse and include how immigration affects developing countries, the interpretation of science and technology in non-Western countries, female employment in China and environmental conservation in Jamaica.

18. Postgraduate Studentships: The ESRC currently invests approximately £1.01 million in studentships that have particular relevance for the developing world. This amounts to 286 students, which is 14% of all ESRC studentships. Topics of study include citizenship and identity in Nigeria, agricultural biotechnology in developing countries, macroeconomic impacts of AIDS and quality of schooling in Africa.

19. Future ESRC investments related to the developing world: The ESRC is currently recruiting directors for three new Priority research programmes in the areas of Ageing, World finance and Non-governmental organisations, all of which have substantial relevance to the developing world. These investments total approximately £15 million of ESRC contribution, although some are currently negotiating further funding from other research councils and/or other organisations. In particular, the New Dynamics of Ageing Programme is a cross-Council initiative that will be jointly funded by the ESRC, EPSRC, BBSRC and MRC.

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<sup>91</sup> <http://www.uea.ac.uk/env/cserge>

<sup>92</sup> [http://www.esrc.ac.uk/esrccontent/ResearchFunding/SecurityChallenges\\_CommReportPhase1.asp](http://www.esrc.ac.uk/esrccontent/ResearchFunding/SecurityChallenges_CommReportPhase1.asp)

<sup>93</sup> <http://www.hull.ac.uk/futgov/>

<sup>94</sup> <http://sbs-xnet.sbs.ox.ac.uk/scisoc/>

<sup>95</sup> <http://www.cesagen.lancs.ac.uk>

<sup>96</sup> <http://www.innogen.ac.uk>

<sup>97</sup> <http://www.ex.ac.uk/egenis>

### Memorandum from the Medical Research Council

#### INTRODUCTION

1. The MRC has had a strong track record in medical research relevant to the health of those in developing countries (detailed in RCUK submission, paragraph 8d). Science and health research are not constrained by international borders and while much of MRC's research relevant to developing countries is carried out in the UK (most of the basic and strategic research into fertility and contraception for instance, takes place in Edinburgh) the overseas units provide unparalleled opportunities to investigate infectious diseases and nutrition in context.

#### RESPONSES TO QUESTIONS

A. *The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

2. In recent years, UK Government's aid policy has emphasised poverty reduction as a central long-term aim of UK investment in developing countries. The Government has also highlighted the need to take advantage of globalisation, and the associated changes in relationships between people and organisations in different countries. This provides an opportunity to explore potential new approaches for extending research investment in developing countries, and to explore new options for organising this work.

3. Health services and public health research are important areas of MRC's portfolio (detailed in RCUK submission, paragraph 15). In 1993, MRC and DFID agreed a Concordat<sup>98</sup> through which DFID influences MRC's portfolio of research relevant to developing countries and funds a substantial share of the work. The Concordat was assessed and renewed in 1998. At the request of MRC and DFID, the Swiss Tropical Institute were mandated to carry out a further review in 2001 to evaluate the effectiveness of the arrangements. MRC also arranged for a scoping study to be conducted to provide advice on its strategy for investment in developing countries in relation to need, scientific opportunity and potential to reduce poverty. The conclusions of the interim report and the scoping study will inform the future operation of the Concordat, the renewal of which is currently being negotiated.

4. As part of the Concordat, MRC and DFID jointly monitor a portfolio of research relevant to developing societies currently worth about £23 million (in 2002–03). Much of this research is relevant to the UK population as well—for example work on TB, AIDS, reproduction, contraception, vaccine technology, sickle cell disease, and nutrition. Table 1 provides a summary of the expenditure within different research categories. Direct support is money allocated to MRC Units and Institutes, indirect is support awarded through grants to universities.

**Table 1**

#### MRC EXPENDITURE ON RESEARCH RELEVANT TO THE HEALTH OF DEVELOPING SOCIETIES

Financial Year 2002–03

<i>Subject Category</i>	<i>MRC/DFID Portfolio Direct</i>	<i>MRC/DFID Portfolio Indirect</i>	<i>MRC/DFID Portfolio Total</i>
Bacterial & Mycobacterial infections	£1,365,914	£808,376	£2,174,290
Epidemiology	£1,098,827	£473,626	£1,572,453
HIV & AIDS	£4,937,145	£3,176,042	£8,113,187
Non-infectious disease	£681,226	£0	£681,226
Nutrition	£543,072	£1,085,943	£1,629,015
Parasitic infection-Helminths	£0	£336,820	£336,820
Parasitic infection-Protozoa	£2,097,013	£1,486,240	£3,583,253

<sup>98</sup> A copy of the Concordat is available from Dr Mark Palmer: 020 7670 5355

<i>Subject Category</i>	<i>MRC/DFID Portfolio Direct</i>	<i>MRC/DFID Portfolio Indirect</i>	<i>MRC/DFID Portfolio Total</i>
Reproduction/reproductive health	£809,959	£592,350	£1,402,309
Vaccines	£344,663	£301,348	£646,011
Vector biology	£0	£326,739	£326,739
Virology	£2,072,547	£149,565	£2,222,112
Virucides	£103,629	£0	£103,629
Total	£14,053,994	£8,737,049	£22,791,043

5. DFID's financial contribution to the MRC through the Concordat arrangements stands at around £4 million per annum. To facilitate co-ordination of the research effort, the MRC invites representatives of DFID to meetings of the Physiological Medicine and Infections Board, where research proposals are evaluated, and also to the Awards Advisory Group where the strategic requirements of Government Departments (eg the Health Departments & DFID) can be taken into consideration before advising Council on funding. There have been other opportunities for DFID to co-ordinate activities with the MRC through participation on the Chief Executive's Advisory Committee on research relevant to health of developing countries and through involvement with a number of ad hoc committees looking at ethics or policy in areas such as HIV/AIDS.

6. Under the previous sectorial division of DFID, the Health and Population's Division supported work that is complementary to that of MRC and which builds on other research funding. For example, DFID and MRC are both partners in the "DART" trial in Uganda, a study on strategies for best delivering anti-retroviral therapy and the largest study of its kind in Africa. The MRC AIDS Programme in Uganda is a partner to the study which is led by researcher at Imperial College London and the MRC Clinical Trials Unit. DFID support the UK's Microbicide Development Programme (MDP) which is establishing clinical trial site capacity in Africa to take forward phase III intervention studies on vaginal microbicides to inhibit the transmission of HIV. MRC administers the allocation of the award (£16 million over five years) on behalf of DFID, and the MRC's Virucide Steering Committee, which also has representation from the Department of Health, provides a strategic overview of activities that impact on the trial.

*B. The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

7. MRC takes a particular interest in the activities of DFID's Knowledge Programmes in the areas of HIV, Malaria and Tuberculosis. The Knowledge Programmes are designed to complement the policies and aims of DFID and its multinational partners in tackling the global problems of malaria, TB and HIV/AIDS. Each programme has its own objectives and workplans but they have several aims in common. The programmes have capitalised on the strong links between the programme managers to establish very close working relationships between the programme teams. The HIV/AIDS STI Programme for example is based at the London School of Hygiene and Tropical Medicine and the MRC Social and Public Health Sciences Unit (SPHSU) and brings together research programmes from over 20 developing countries worldwide.

*C. The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes*

8. DFID has taken a lead in "Getting Research into Policy and Practice" and supports the dissemination of information through support of the ID-21 web site ([www.id21.org](http://www.id21.org)) hosted by the University of Sussex. The 2001 Interim review of the DFID/MRC Concordat by the Swiss Tropical Institute identified the following areas where principle investigators of current portfolio research had identified significant long term impacts of the products of their research:

- Preventive measures (including Vaccines);
- Drugs (treatment regimes and feasibility studies);
- Other medical technologies/contraceptives;
- Diagnostics;
- Disease specific information;
- Health policy change; and
- Health services delivery.

9. One of the most significant public health measures to have emerged from work supported under the MRC/DFID Concordat has been the introduction throughout the world of programmes to distribute and promote the use of insecticide-impregnated bed-nets to prevent the transmission of malaria and reduce child mortality. Following studies on the impact of bednets on child mortality carried out by MRC-The Gambia, and repeated in many different countries in the developing world, there have been a number of national impregnated bednet programmes, and the WHO initiated its Malaria Intervention for Child Survival Programme. Increasingly, donors and health ministries of endemic countries are considering implementing insecticide-treated bednet programmes as integral components of national malaria control strategies.

10. We can only comment on the impact that DFID's research programmes on health have had on the public health policies of developing countries.

11. Health policy will develop in response to a number of socio-economic factors and research outputs, no matter how significant, may have less impact than political agendas on determining new public health measures. The capacity to influence policy is strongest where the research has been developed in partnership with local health departments or where it meets local government objectives for health improvements. It is therefore not surprising that the biggest impact of work on which we can comment under the MRC/DFID Concordat has arisen in the context of MRC's investments in The Gambia and Uganda where there has been a long term commitment to getting research into policy and practice and where the Governments are sensitive to health messages coming out of MRC research. Nevertheless, results from MRC and DFID's research will also complement the outcomes of other studies worldwide and it is the combined impact of a number of intervention studies, particularly when adopted as part of WHO programmes, that have led to significant changes in health policy in developing countries in recent years.

12. In 2000, the Ugandan National Health Research Organisation (UNHRO) carried out an analysis of institutions doing health research in Uganda. UNHRO identified that the contribution of each individual research programme to changing practices or policy in Uganda may appear to be minimal because changes are normally slowly adopted. Nevertheless the report singled out the MRC Programme on AIDS in Uganda (which includes work funded under the Concordat) to demonstrate how research has contributed to changes in policy and in the enactment of policies. As DFID is closely involved with the work of the Unit, and the Uganda country representative maintains close links with the MRC, these comments are indicative more widely of the impact of DFID's programmes on promoting development through improved health.

13. Research within the MRC Programme on AIDS in Uganda includes population studies on the dynamics of HIV-1 transmission, natural history of HIV-1 and social and behavioural studies related to interventions in rural settings. Some of the findings which have impacted on health policy and strategy development are:

- Three-fold risk associated with drinking alcohol and HIV infection. This has affected public health campaigns stressing the relationship between alcohol and HIV.
- In concordant HIV negative couples, males bring infection into the marriage (from extramarital sexual behaviour) at twice the rate of females. In sero-discordant couples females seroconvert at twice the rate of males. This not only provides insights into population dynamics of HIV infection but has led to an expansion of HIV testing and counselling services.
- In rural Uganda HIV infection is associated with an increased risk of malarial parasitaemia. This interaction is of great public health importance due to the likely increase of mortality and morbidity and has informed practice throughout Uganda.
- Behavioural studies show that there has been an increase in acceptance of condom use to protect against HIV and STDs as well as a reduction in the number of sexual partners. Behavioural studies complement epidemiological surveys and inform public health officials about the acceptability and impact of public health measures.
- Social science studies have highlighted the impact of the HIV epidemic on the problems of the elderly in rural Uganda. Policy-makers have been made more aware of the needs of the elderly in rural Uganda and are moving to provide more support for this population.

14. In the Gambia the Government has established a new National AIDS Secretariat supporting a multi-sectorial National AIDS Committee chaired by His Excellency The President. The strategies adopted by the National AIDS Control Programme build on the observations and advice from the MRC Laboratories in The Gambia and include:

- Intensification of information, education and communication on HIV/AIDS/STIs.
- Wider promotion of condoms.
- Provision of safe blood at divisional and central level.
- Mobilisation of specific groups, youth, commercial sex workers and their clients.
- Provision of STIs care services.
- Adoption of participatory approaches in reproductive health management (eg "Stepping Stones" project).

- Prevention of HIV transmission through health care setting.
- Advocacy through opinion leaders.

D. *The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes*

15. Capacity development for health and research are part of the impact on national policies referred to in the previous section.

E. *The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced*

16. The MRC works closely with the private sector, particularly pharmaceutical companies, in certain specific topics in developing countries (detailed in RCUK submission, paragraph 27). To better understand how the MRC could help bridge the “development gap” (between the products or outcome of academic researchers and what a company will need in order to invest in a potential new drug or vaccine), for products relevant to the treatment or prevention of malaria, the MRC recently organised a workshop bringing together academics from the malaria field, interested parties from biotech and large pharma, and representatives of private initiatives such as the Medicines for Malaria Venture, Malaria Vaccine Initiative and The Bill and Melinda Gates Foundation. The meeting identified some of the difficulties that academics faced in moving from potential targets to screening chemical libraries, and developed a better understanding of how far down the drug or vaccine development process it would be necessary to go before beginning to develop public-private partnerships to develop products in preparation for human intervention studies. MRC is exploring how the lessons learned from the meeting can now be practically advanced.

F. *The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

17. While it is not formally part of “development policy”, the MRC supports scientific training in developing countries (detailed in RCUK submission, paragraph 35). In addition, to the on-the-job training provided in all MRC’s overseas Units, MRC Laboratories The Gambia have made arrangements with the University of Westminster to offer a two-year period of training to laboratory staff leading to the award of a Diploma in Biomedical Sciences. The scheme was launched in 2001, and in 2003 10 students from the Unit, together with five students sponsored by The Gambian Government, successfully graduated and were awarded Diplomas. Subject to certain requirements being met, MRC has also agreed to support the scheme to provide support for PhD scholarships for students from developing countries to train in the UK (detailed in RCUK submission, paragraph 36).

#### Annex 4

### Memorandum from the Natural Environment Research Council

#### INTRODUCTION

1. This NERC response draws on input from several NERC Centres, but principally from the British Geological Survey (BGS) and the Centre for Ecology and Hydrology (CEH). Both have extensive experience of international development work, funded *inter alia* by the Department for International Development (DFID) and its predecessor, the ODA.

2. Two of NERC’s Strategic Objectives, outlined in its Science Strategy<sup>99</sup> (“Science for a Sustainable Future” 2002–07) are:

“to work with other Research Councils and policy makers to review and strengthen mechanisms for provision of scientific advice and expertise to policy makers, and to examine how research outputs can best inform UK and international policy development and implementation” and . . . “to drive the UK’s participation in international programmes and initiatives aligned to our science priorities”

3. The Strategies of NERC’s Research Centres include similar aims. For example the Centre for Ecology and Hydrology Science Strategy<sup>100</sup> states:

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<sup>99</sup> <http://www.nerc.ac.uk/publications/strategicplan/>

<sup>100</sup> [http://www.ceh.ac.uk/products\\_services/publications/online/science\\_strat02-07/CEH.pdf](http://www.ceh.ac.uk/products_services/publications/online/science_strat02-07/CEH.pdf)

“... we will provide stakeholders with the knowledge base needed to develop, inform and guide policy, and fulfil the UK’s commitments under international agreements such as the Kyoto Protocol, United Nations (UN) Convention on Biological Diversity, the European Union’s (EU) Water Framework Directive, and the recommendations of the World Summit on Sustainable Development”

4. The British Geological Survey Science Strategy<sup>101</sup> includes a section on overseas assistance:

“Outside Europe the BGS is in demand for its know-how, founded on its national geological survey status, length of international experience and breadth of expertise. In developing countries different needs take on higher priority: a) providing technical cooperation and assistance in acquiring and exploiting a national geosciences science base; b) finding managing and exploiting natural resources effectively; c) avoiding major loss of life, liabilities and financial losses arising from natural disasters, hazards and mismanaged risks; d) helping the UK play its full part in international poverty alleviation.”

5. NERC-CEH’s prime role in development is carrying out research in water resources and optimising tropical landuse. NERC-BGS has a long history of institutional strengthening and research for development in the groundwater, minerals, energy and hazards sectors.

#### RESPONSE TO QUESTIONS

A. *The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID.*

6. Environmental science is a global issue. The key drivers include understanding the earth’s life-support system, climate change and sustainable economies. Knowledge arising from NERC funded science is often transferred internationally, for example, through work commissioned by DFID, other aid agencies, development banks or foreign governments and international organisations, or through collaborative programmes.

7. Most international interaction is stimulated by a “bottom-up” approach of responding to opportunities, rather than following a coherent strategy. Whilst this approach is flexible it can also be fragmented and short-term. The potential benefits to the UK arising from science in diplomacy, for example, through building long-term relationships with overseas nationals who may do post graduate or post doctoral studies in the UK, are reduced. Similarly, the longer-term benefits to UK trade of a strong British presence in aid technology projects is not seen as the direct responsibility of either the DTI or DFID in setting their departmental policy objectives.

8. There is a lack of long-term underpinning research applied to the particular environments of developing countries, which has been accentuated by DFID’s strict focus on poverty elimination. As a result good research ideas often fail to be funded, being too applied for the research councils, but too “scientific” for DFID.

9. NERC, like the other Research Councils has a Charter which says that its activities *inter alia* should contribute to the economic competitiveness of the UK and quality of life of the UK. NERC however has successfully made the case for “Earth System Science” and the need to understand better the interactions between components of the system at a variety of scales: global, regional and local. It is also understood that UK competitiveness in some areas may best be achieved by UK scientists working on problems overseas. Where we can link NERC research to underpinning other areas of government policy we do so. This is particularly so, in areas where UK science can inform the UK negotiation line on international treaties, and where our science may make a contribution to DFID international development policy. The Government’s July 2002 Strategy for Science Engineering and Technology “Investing in Innovation”,<sup>102</sup> however, made no reference to the role of UK science in addressing problems overseas.

10. NERC has an annual bilateral meeting with the FCO, and regularly hosts visits of FCO Science and Technology Advisers. It is hoping to strengthen contacts with the FCO Environment Network and the FCO Global Opportunities Fund.<sup>103</sup>

B. *The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

11. NERC’s research has a record of influencing policies and programmes. For example:

- Work on fruit trees in the Cameroon led to a change in policy towards the importance of commercialisation of indigenous fruits as a poverty elimination mechanism. Further work in Guyana and South Africa showed the best economic strategy to adopt to achieve this.

<sup>101</sup> <http://www.bgs.ac.uk/about/docs/Strategicplan.pdf>

<sup>102</sup> <http://www.ost.gov.uk/policy/invest-innov.htm#top>

<sup>103</sup> This has a three-year budget of £120 million and components dealing with human rights and legal reform, democracy and good governance, environment and energy, and international security.

- Work on the development of a Water Poverty Index has the potential to give the international donor community an objective method of assigning priority to development interventions in the water sector. The Water Poverty Index was included in the World Water Development Report presented at the Kyoto Second World Water Forum.
- Work on mechanical separation of sediments in the gold mining process has led to reductions in the use of mercury which, previously, contaminated stream waters and caused ill health.
- Work on the use of certain types of limestone as a locally produced fertiliser has increased crop yields, substituted for imports and created employment in several countries.
- Work on climate change impacts and mitigation strategies (for example a joint CEH/POL project in Bangladesh) is informing policy makers of future economic social and environmental threats.

12. Recent contact between NERC and DFID has been limited. The last bilateral was held on 16 March 1999, where it was agreed that NERC and DFID would meet twice per year (and two workshops would be organised in areas of mutual interest—climate change and environment plus health and environment). A senior DFID staff member, Andrew Bennett, was a member of NERC’s Resource Strategy Group (now the NERC Science and Innovation Strategy Board), and the close relationship at that time made a formal Concordat unnecessary.

13. The Surr Report on “Research for Poverty Reduction (2002)<sup>104</sup>” recommended to DFID that relationships with Research Councils should be strengthened, and DFID subsequently contracted RAND International to identify options for closer collaboration. RAND recommended establishment of an International Development Research Funders Forum, similar to the Environment Research Funders’ Forum<sup>105</sup> chaired by NERC. NERC are keen to see some form of regular contact re-established.

14. Contact between DFID and individual NERC Research Centres is now much weaker than it was. Whereas DFID’s predecessor, ODA, maintained a full-time mining advisor, the role has been progressively reduced to a one-day-a-week input from the British Geological Survey. The previous CEH function of water advisor to DFID has recently been ended. Another example is the recent withdrawal of the Knowledge and Research (KaR) Programmes in the geosciences and water sectors. These KaR Programmes have, over many years, provided generic scientific and engineering solutions to numerous development issues in poor countries, in areas of water supply, artisanal mining, environmental protection, attracting inwards investment and managing data. The KaR Programme has been widely lauded by external reviewers as being focused and cost effective.

*C. The extent to which investment in research and the promotion of innovation play a part in DFID’s country level development programmes*

15. DFID rightly places a high emphasis on its Country Strategy Papers. In general, country level programmes are focused on immediate problems and do not fund innovative research. Thus they can appear short term and blinkered. Longer term, sustainable solutions based on relevant research can be missed. Examples of such investments are detailed in the RCUK submission, paragraphs 19 and 20. NERC supports the recommendations made regarding Country Plans in the RCUK submission, paragraph 21.

*D. The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes.*

16. NERC’s BGS, through work commissioned by the World Bank, is involved in several capacity building projects in developing countries. For many such countries, the only viable, long-term, sustainable way out of poverty is through the development of natural (mineral) resources, predicated on effective capacity in licensing and regulating the activities. The importance of this work as a contributor to good governance, education and economic development is well recognised by the World Bank and several European aid agencies (the Nordic Development Fund, DANIDA, Coopération Française, etc) but not by DFID, which no longer funds such activities.

17. Only by supporting the development of local capacity in developing countries can those countries compete effectively in world trade and secure local benefits. However, we feel that greater coordination between DFID, DTI, FCO, DFES, Defra the HEI sector, NGOs, charities and other aid agencies/development banks would be highly beneficial.

18. To meet the Millenium Development Goals for water requires the training of a large number of water professionals to manage the water resource infrastructure which must be put in place. NERC’s CEH has been proactive in initiating and participating in the UNESCO programmes Flow Regimes from International Experimental and Network Data (FRIEND) and Hydrology for the Environment, Life and Policy (HELP), which are a mechanism for creating this expertise.

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<sup>104</sup> [http://62.189.42.51/DFIDstage/Pubs/files/Res\\_pov\\_red.htm](http://62.189.42.51/DFIDstage/Pubs/files/Res_pov_red.htm)

<sup>105</sup> <http://www.erff.org.uk/>



19. The World Meteorological Organisation (WMO), Hydrological Operational Multipurpose System (HOMS) is a network which aims to build capacity and promote international measurement standards by disseminating training material for hydrology from developed to developing countries. CEH is the UK National Reference Centre for HOMS. Until 2001 this work was funded by DFID, unfortunately this is no longer the case.

*E. The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced.*

20. The importance of knowledge transfer is in the long-term self interest of many parts of the UK private sector, in that markets are created in developing countries for their products and services. Many African countries face the problems of a low technology/education base and decimation of the few highly educated and skilled people from HIV/AIDS. In South Africa, the new Minerals and Petroleum Resources Development Act, Mining Charter, Money Bill and Beneficiation Bill will require large numbers of South Africans to be trained and receive technology transfers. Some of the benefits of this, such as renewed mining licences, supplies of equipment and consultancy, will flow back to UK based industries. There is a role for the Research Councils and UK universities to work with UK industry and overseas governments to support such knowledge transfer.

21. In the water sector, OASIS is a Resource Centre sponsored by DFID and led by CEH, BGS and HR Wallingford Ltd. OASIS works in partnership with DFID, other donors, UN Agencies, developing country Governments, NGO's and other stakeholders to provide expertise in water resources issues. This expertise is drawn from the OASIS network of organisations which include private sector companies. It has the potential to be a vehicle for greater private sector involvement.

22. OASIS should provide a range of services to help create, access, share and use knowledge with those involved in the water resources sector. These services are focused upon helping DFID and its partners to deliver the Millennium Development Goals. Unfortunately, activity is currently stalled as a result of DFID's reorganisation.

*F. The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

23. All NERC projects aim to build capacity by working with developing country national institutions. We provide training, at all levels, through on-the-job experience in the whole spectrum of research from project planning, to writing up and dissemination of the results. We are most successful when we have repeat funding that allows us to work with one institution for a long period. Long term, institutional strengthening is more effective than training individuals on a project by project basis.

24. Current examples from the British Geological Survey include technical training in minerals information systems (Mozambique, African Development Bank, funded); field mapping and database/GIS building (Mauritania, World Bank funded) and training in geophysics and satellite image interpretation (Papua New Guinea, World Bank funded).

25. The Earth Systems Science Centre (ESSC) at the University of Reading (a NERC Collaborative Centre) carries out research into the efficient and effective use of observations in models of environmental processes, and uses innovative technologies in this, including in remote sensing and e-Science. They train scientists from developing countries, often as part of larger international programmes. Some have support from the British Council or other support via DFID. However ESSC report almost no contact with DFID, in contrast to relations with DTI, Defra, MOD, the Met Office and the Environment Agency. This lack of contact contrasts with the US, and other developed countries, where there is very considerable interaction between Earth Observation and development programmes (eg between NASA and USAID).

26. The Proudman Oceanographic Laboratory (POL) provides training to overseas scientists and technicians in sea level monitoring, and host students with British Council sponsorship.

27. NERC would welcome new funding to offer degree, post graduate or post doctoral level study opportunities to suitable students of developing countries. NERC's Centres and Surveys already provide on-the-job and short course scientific and technical training to counterparts of many developing countries, as integral components of work commissioned by the World Bank, and others (but not funded by DFID which rarely, if ever, sponsors such activities).

November 2003

## APPENDIX 59

## Memorandum from the Natural History Museum

## INTRODUCTION

The Natural History Museum is a key UK and international focus for natural resources and biodiversity research, collaborating with government agencies, NGOs, scientists and others in many countries in support of biodiversity conservation and sustainable development. It is expert and active in biodiversity information provision, in developing methods for biodiversity assessment, and in providing evidence for biodiversity conservation policy, often within the wider context of development. In parallel to this the Museum has developed extensive research on mineral resources and their use.

The Museum holds unique collections from all over the world, and is a source of global expertise on the natural world. The research carried out by the Museum in the areas of human and animal diseases, crop pests, invasive alien species, and economically important plant and animal species is of vital importance for both the developing and developed world. Museum research covers not only the living components of the natural world but also interactions between the geological and biological worlds. Research is underway on the interactions between soil minerals and microbes which play a critical role in governing the health of terrestrial ecosystems and in controlling overall soil quality. Museum research on the uptake of heavy metals in soils by plants and other organisms is helping us to understand how environmental contaminants enter the food chain.

The following evidence has been assembled by the Museum's Biodiversity Liaison Officer in consultation with colleagues within the Museum.

(A) *The coordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID.*

1. The Museum's taxonomic and wider biological research is essential for biodiversity conservation, which in turn is vital for sustainable development, particularly in developing countries which are often heavily reliant on natural resources for food, building materials, medicinal products, energy sources and a wide range of other goods and ecosystem services. Without fundamental taxonomic information, we cannot do effective research on the importance of different elements of biodiversity, understand their direct economic values, define the ecosystem services to which they contribute, or take effective action to manage and conserve the biodiversity of which they are a part.

2. The NHM has a particularly important role to play in this area because of (1) the international scope of the systematic expertise it has, (2) the global coverage of the collections it holds, (3) the experience NMH scientists have in applying their expertise to practical problems in developing countries and in collaborating with governmental, non-government and scientific organisations in these countries.

3. The Museum's principal source of funding is the UK Government through the Department of Culture Media and Sport (DCMS), which provides grant-in-aid under a three-year agreement and special payments for essential capital projects. Grant-in-aid accounts for over 90% of our available funding for the year—the balance coming from admission charges for special exhibitions, sponsorship and donations, and commercial activities. The Museum's scientific activities are funded mainly by grant-in-aid, but also from a variety of other sources including UK research councils, other government departments, the European Union, international organisations, and trusts and charities.

4. However, although the Museum engages actively with the UK government, European and international institutions in fulfilling their research needs, the Museum's research is not explicitly coordinated with UK Government policy in the area of development and poverty alleviation, except to the extent that this is one of the policy objectives of the Darwin Initiative. The Museum's work in many cases provides evidence and information that can support the scientific and socio-economic policy objectives of the host country, sometimes directly where this is an explicit goal of a collaborative project, and sometimes in a less direct manner by contributing to the body of scientific knowledge available to policy makers. The Museum's work also actively supports the policy objectives and international obligations of the UK Government in the context of the Convention on Biological Diversity, many aspects of which address the development needs of the Parties. DEFRA takes a policy lead on this within government and its policy objectives complement those of DFID on development in the broader sense.

5. The UK Government has made a commitment to provide assistance to developing countries in the areas of biodiversity conservation, poverty alleviation and sustainable development under the Convention on Biological Diversity (CBD), the Millennium Development Goals, and in the Plan of Implementation agreed at the World Summit on Sustainable Development (WSSD). These and several other multilateral agreements concluded in relation to biodiversity conservation, international development and sustainable development cover a great deal of common ground. However, there is considerable scope for improving coordination of the research that informs development and implementation of policy

6. As an example in biodiversity conservation, and the science that underpins policy, the House of Lords Select Committee on Science and Technology, in its report “What on Earth? The Threat to the Science Underpinning Conservation (May 2002)”, recommended, “that DEFRA takes the lead in setting up a body with the express purpose of bringing together representatives from Government departments, ecologists and conservationists and the systematic biology community, including those based at museums, universities and other institutions” in order to, “identify priority areas of biodiversity for which taxonomic research is most needed by the conservation community, and for other national purposes, such as health and agriculture.”

7. In this area, although DFID has in the past promoted the importance of action on biodiversity, the department does not seem to have engaged in defining the research agenda to underpin development/biodiversity conservation policy with institutions such as the Museum. The Museum would welcome discussions with the department on its research needs within the wider context of response to policy demands in the UK and elsewhere.

*(B) The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

8. The NHM’s collections and expertise are global in geographic coverage and therefore represent a vital resource for research by both NHM scientists and collaborators, and (through an extensive international loans programme) for research by scientists in developing countries. NHM science has helped combat human diseases such as malaria, has produced environmentally friendly ways to manage invasive alien species and crop pests, and has contributed to the development of sustainable agricultural practices in developing countries.

9. The NHM’s collections, the research it carries out and its scientific staff all represent a globally unique pool of expertise, experience and information, which can be applied to fundamental research questions and particular applied needs in developing countries. Through its collaborative research the NHM has also built up a network of scientific, governmental and non-governmental contacts in developing countries all over the world, and is well experienced at working with local partners in particular political and policy contexts.

10. However, the Museum is not currently being actively used by DFID as a source of scientific or other advice. The Museum has worked under contract to DFID on a collections assessment project and would be happy to discuss with DFID how such a relationship could be further developed.

*(C) The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and In capacity-building programmes for the benefit of developing countries can be enhanced.*

11. The NHM has worked with or been supported by private sector companies in the developed and developing world on some projects in support of biodiversity conservation and sustainable development and natural resources use. Although these projects reflect the capabilities of the Museum and the priorities of the private sector company involved, they may not always be developed to address the wider policy needs of the developing country or countries involved.

12. A case in point is the information gathered by Museum scientists carrying out work for private sector companies in developing countries. The information may be shared at the time with government in the countries involved as part of the conditions of the contract. However, over time it is the Museum that develops a more substantial base of information from numerous sources and different projects, which may have potential interest for development policy. Adapting and presenting information to policy needs does require focused discussion and resources, but the Museum would welcome wider discussion on the potential for using this information to underpin policy.

*(D) The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries*

13. The NHM provides a wide range of scientific education and training services to developing countries in the areas of biodiversity conservation, natural resource management, and public awareness. Three examples of such work are provided below;

14. *Coastal Biodiversity in Ranong, Thailand.*

Thailand is a country rich in marine biodiversity. Marine resources are used as food, provide medicines and are the basis for tourism. Marine ecosystems also provide services such as protection from environmental extremes; for example, mangroves act as a buffer zone in coastal areas, protecting against the worst effects of storms. In Thailand marine and coastal biodiversity is being lost due to the drainage and clearance of swamps, marshes and mangroves to provide land for housing, tourism and industrial development, and the loss of mangroves due to the enormous expansion of prawn culture. With the support of the European Union, Museum scientists are helping to provide both primary biodiversity information and training to underpin biodiversity assessment and long-term environmental monitoring in Thailand. This will enable Thai scientists to measure changes in marine and coastal biodiversity and so provide policy makers in Thailand with the information they need to ensure that the development of their coastal regions is sustainable. The project’s biodiversity-assessment activities are complemented by development of an educational programme to support and promote biodiversity awareness in local communities. See: <http://www.nhm.ac.uk/science/projects/ranong/index.html>

### 15. *Land Snail Diversity in Sri Lanka*

Sri Lanka has an exceptionally rich and important land mollusc fauna, with almost 250 described species of snails, as well as many new species that have yet to be described. Almost all these species are native to Sri Lanka, and most are endemic—they are not found anywhere else. Snails are recognised as a useful indicator species for measuring environmental quality. A few, however, are recent introductions in Sri Lanka, and many of these are important agricultural and horticultural pests. With the support of the UK Government's Darwin Initiative, NHM scientists, working with colleagues in Sri Lanka, have surveyed the country's mollusc fauna and produced a field guide, and have trained conservationists in Sri Lanka to use the guide. The project will enable Sri Lankan scientists to identify and monitor native snails and protect them from introduced species. The project will also help Sri Lanka to reduce the economic impacts of invasive snail species on its agricultural production.

### 16. *Arboles Del Mundo Maya/Trees of the Mayan Area*

The NHM is a leading partner in a project (funded by AVINA Inc.) in the Yucatán Peninsula (Mexico), El Petén (Guatemala) and Belize, which aims to create lasting partnerships between conservation-oriented NGOs and more scientifically-oriented governmental institutions. The project has set up a partnership between NGOs and museums for the production of high quality field guides to the trees of the Maya Area. The guides, distributed as a CD-ROM, can be used to build business opportunities for local NGOs wishing to encourage ecotourism. The guides can also be used by scientists wishing to carry out biodiversity surveys and a library of images of trees and their characters for use by the partnership have been created. An automatic field-guide generator has been designed which uses the collected images to produce field guides for either ecotourists or conservation practitioners. See; <http://www.nhm.ac.uk/botany/cuttings/issue5/research/#no1>

November 2003

## APPENDIX 60

### Memorandum from The Royal Society

#### SUMMARY

With regard to technical and scientific matters, international development policy is currently not well joined up within the UK Government. DFID has insufficient in-house scientific expertise and an inadequate relationship with the Research Councils and other Government Departments to provide cohesive research and knowledge support in relation to international development policy. To develop capacity in this area, the co-ordination of the use of science research across government organisations needs to be strengthened.

We therefore recommend that DFID establish a Chief Scientist's post, supported by a scientific team, to improve the co-ordination and integration of scientific strategies within the department.

We support DFID's aim and associated objectives to eliminate poverty in poorer counties. However, by concentrating on small-scale highly specific projects, long-term and/or underpinning scientific research are often neglected. This research, particularly in relation to natural resources and the environment, is vital in providing overarching results, such as identifying long-term trends that can inform a wide range of issues and projects.

Support for progressing and maintaining the science base in developing countries is essential to furthering their human resources and to science in general. Apart from a number of very limited funded exchange programmes, the UK is not providing adequate resources for scientific training and capacity building in poorer counties.

*The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID*

#### *Funding*

In 2001–02 DFID spend allocation was over £3.1 billion of which £91 million was spent in Research and Knowledge Investment (DFID 2001). This funding is currently divided into a Health and Population Research Strategy, an Economic and Social Research Strategy and a Renewable Natural Resources Research Strategy (RNRRS). The DFID Web Site identifies thirteen major funding award schemes to organisations, of which only one is specifically related to technical matters.

DFID is currently formulating its New Research Strategy, which is due for completion in December 2003. Until this has been finalised, funding available for new research spending in 2004–05 is just £5 million, which is destined only for small policy-orientated research, mainly in the social sciences sector.

As the Government acknowledged in the 1997 White Paper on International Development, knowledge, research and technology are vital to achieving DFID's objectives. Any reduction in funding research would therefore have a significantly detrimental impact on the UK government fulfilling its international development goals.

*Co-ordination of research support—Research Councils*

We welcome the current DFID study to identify and develop links and funding opportunities between itself and the Research Councils (RCs) and are encouraged that the outcomes are set to become one of the major working practices identified to underpin the New Research Strategy. There are clear advantages in initiating joint studies and further co-ordination with the RCs. For example the research remit of NERC, which funds highly relevant research in developing countries, puts it in a position to make a significant contribution to many of DFID's concerns relating to natural hazards, biodiversity, water resources and environmental change in the context of sustainable development.

*Co-ordination of research support—within DFID*

We consider a significant level of in-house scientific expertise within DFID vital to facilitate the co-ordination of research and important to provide a channel from the results of research programmes to inform the policy making process. Without such knowledge, determining a research agenda will be difficult. The RNRRS Strategy, which covers the main programmes in the natural resources sector, for 1995–2005, is divided into 11 bilateral programmes, which are funded through DFID's Rural Livelihoods Programme and are managed by academic or private sector institutions. With the majority of this research administered, undertaken and contracted out to external organisations and companies, the Royal Society has concerns over the level of in-house experts available within DFID to assimilate, disseminate and co-ordinate scientific research.

As part of the New Research Strategy, we consider it essential that there are mechanisms in place to feed back the results of research projects to inform the future work of country programmes and DFID's strategic research policy. An example of a framework to ensure that research is undertaken with due consideration of related studies and the dissemination of results to any interested parties is recommended in the Royal Society report on Measuring Biodiversity (2003).

*Co-ordination of research support—across Government*

There is a need to strengthen co-ordination on the use of science research across government organisations with regard to international development policy.

DFID currently has no chief Scientist. DFID's Chief Human Development Advisor, Dr Julian Lob-Levyt, at present attends the cross-departmental meetings of the Chief Scientist's Advisory Committee (CSAC). What is unclear is how information from DFID research informs their representative to the committee, and in turn, how the Governmental meeting provides direction back into the work of DFID. The Department for International Development also does not have a permanent representative to the Chief Scientific Advisor's International Committee on Science and Technology (CSAIC).

We recommend that DFID look carefully at the successful developments within DEFRA, which include the creation of a Chief Scientist post as well as scientific staff with a mandate to co-ordinate with other relevant Government Departments and national institutions. These developments are leading to improved co-ordination and the development of integrated scientific strategies within this Department. For example DEFRA are becoming well integrated into climate change science in the UK, forging good links with UK Institutions like the Tyndall Centre, the Met Office (in particular the Hadley Centre), NERC and EPSRC. We recommend that a similar structure should be assessed for DFID, as it is highly probable that implementing a Chief Scientist and a science/technology team within the Department would promote co-ordination and the development of a cohesive research policy.

If DFID had an internal scientific advisory team, funds would be more efficiently allocated to help co-ordinate the scientific aspects of a unilateral or a joint international response to crisis management. This ability would be beneficial to the countries concerned and strengthen the response by the international community.

*Underpinning research*

The focus by DFID on poverty elimination has led to a lack of underpinning environmental research. With the notable exception of the Darwin Initiative (on tropical biodiversity research and capacity building), which is managed by DEFRA, there is no programme that funds strategic environmental research in developing countries. As a result, country level programmes tend to fund short-term projects that are focused on immediate problems, and underlying research such as that undertaken by the International Geosphere-Biosphere Programme (IGBP) often fails to be funded. Research projects, not directly related to immediate relief from poverty, may provide a substantial contribution to the long-term success of related schemes or enable beneficial innovations in the future.

DFID policy on natural resources science is concentrated mainly on small-scale highly specific projects, which over the past decade have had an increasing focus on the social aspect (DFID 2001). While there may be some understandable reasons for this emphasis, larger scale, overarching projects, which have the advantage of informing a number of research areas, are precluded. Proposals for these initiatives, such as

for the modeling of large-scale agricultural or hydrological parameters, receive essentially no funding, and even lack a clear mechanism for submitting proposals. Although the outputs of such projects may be of considerable importance and value, they are sidelined as the benefits are not directly for individual citizens, but filtered down through governments and NGOs.

To give a specific example, satellite-based monitoring of rainfall is the only feasible way of obtaining an overview of the large-scale rainfall pattern in Africa. Governments and NGOs could use such information to feed into flood and famine warning systems and crop yield modeling. However little emphasis is placed on this research, as it is not of direct use to individual farmers.

It is vital that policymakers with responsibilities for funding research to eliminate poverty comprehend that knowledge is often obtained through a mosaic of projects, which may have indirectly related, but fundamentally important, research objectives.

*The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes*

Although IGBP research aims to underpin and influence international policies and decisions, the IGBP National Committee is not aware of any advice being sought by DFID.

Where research or work has been undertaken, many scientists have found that what is often the most important aspect of a project, namely the delivery, is frequently left undone. For example after providing funding for the production of a Hydrological design manual for slope stability (Anderson 1997), to help communities at risk from landslides, no follow-up work was undertaken within the affected communities to educate them with the necessary technical expertise and good practice relating to the study.

As mentioned above, if researchers followed a framework to ensure that protocols are adhered to in the dissemination and circulation of information and results, as presented in the Royal Society report (2003), this would strengthen the routine co-ordination of information. In the case of biodiversity research, this would also ensure that at the outset, the most appropriate research methodology is applied.

*The extent to which investment in research and the promotion of innovation play a part in DFID's country level development programmes*

The short-term nature of DFID funded projects appears to hinder research on the development of innovative techniques. In an example of the management of a volcanic crisis at the Soufriere Hills in Montserrat, DFID were, quite rightly, open to resourcing innovation in technology provided that it could be demonstrated that the new technology either made the monitoring more effective or more cost-effective or preferably both. However the responsibility DFID undertook in technical innovation did not stretch much further than the immediate.

In the case of Montserrat, where the volcano will be active, if not erupting, for the foreseeable future, it appears that DFID does not have a clear view of how a strategic programme of scientific research, to generate a deeper understanding of the behaviour of the volcano, could inform policies about the long-term development of the island. Officials have often given the impression that DFID would pay for the immediate monitoring of the volcano, but would not fund research. Neither has there been much evidence of co-ordination with the NERC, which has funded some scientific research on Montserrat.

*The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes*

As we highlighted in the Royal Society document (2002a), for developing countries facing food and water insecurity, pandemic diseases, lack of infrastructure and, in some cases, civil war, the introduction of TRIPS (the Agreement on Trade-Related-Aspects of Intellectual Property Rights), which calls for rigorous IPRs (Intellectual Property Rights) legislation, would be an absurd use of scarce economic, political and social resources. IPRs can be effective in stimulating innovation and benefiting society, but developing countries should not be encouraged to introduce IP (Intellectual Property) laws until the level of economic development is such that the introduction of a given IPR is beneficial. It will not be necessarily be appropriate to introduce all forms of IPR at the same time.

Science is an important driver of economic and social benefit and it is important that IPRs, such as copyright, do not inhibit unnecessarily the sharing of knowledge.

*The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced*

Establishing long-term strategies and relationships between individuals and organisations is central to solving many of the chronic science-related problems in the developing world. These may often require long-term commitments of funds to suitable scientific agencies and programmes, which have an altruistic or philosophical mission even when the funds dwindle. NGO's and Research Institutes with missions based on the public good and societal needs are more likely to have the incentive and desire to maintain long-term strategies and relationships. However, given sufficient resources alongside clear and focused terms of

reference, the private sector can play an effective and valuable role in international development. Nevertheless, long-term issues are not necessarily well served through relatively short contracts to the private sector, whose interest may dissipate once the contract finishes.

We have concerns that some contracts and projects are given to consultants and companies who have little experience or expertise in capacity building and knowledge transfer. In general we consider the private sector should be involved only where the situation is appropriate. In assessing the potential contribution of the private sector, it is important to consider the ethos, experience and long-term commitment as well as the cost-effectiveness of individuals and organisations.

*The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

Support for progressing and maintaining a science base in developing countries is highly valuable as it ensures that the human resource is encouraged for the benefit of the countries concerned and for the advancement of science in general. Provision of support for research and universities will also contribute to future professionals, such as schoolteachers in a particular country. Aiding a developing nation's science base has a direct relevance for strengthening its scientific/technological capacity to address issues of immediate importance such as pollution, epidemics and climate changes. Fostering international academic contacts also has an ongoing contribution to furthering global stability and security. Providing aid to progress the science capacity within developing nations has the advantage of helping a country develop institutions and expertise to move towards self-sufficiency in the long term.

A considerable limitation to any scheme that removes students from developing countries for their full training is that many bright young scientists will be tempted by lucrative employment in the developed world and never return to their countries of origin to pass on the benefit of their training. A further problem in providing training in a developed country is that at the more senior and experienced level, such schemes take critical people away from their key duties and responsibilities, as it is typically the more experienced and dedicated people who take up scholarships and visiting schemes. Supporting training and doctoral schemes within developing countries is a mechanism to address this issue. Developing regional training centres would encourage students to stay if not in, close to their country of origin and help foster national and international networks.

Nevertheless, UK science would benefit from increasing PhD and postdoctoral students, particularly from the more advanced developing countries. We welcome the new Dorothy Hodgkin Postgraduate Scheme recently announced by the Prime Minister to provide funding for PhDs to students from the developing world. However, innovative, bi-lateral schemes should be developed to encourage students, after finishing their education in the UK to return home. It is also regrettable that the name chosen for the programme is already used and associated with a scheme that funds opportunities for science career development in the UK.

A common way of providing training is through scholarships and international visits. The UK has a number of very good programmes, including British Council Scholarships and the Royal Society Exchange Programme and visiting schemes in many developing countries. A good example is the joint administrated Royal Society and South African Government, Science Engineering and Technology programme (Annex 1), which has helped develop science capacity in some of the most under-funded and disadvantaged universities in South Africa. We also recognise the important contribution of the DFID funded FICHE programme (Fund for International Co-operation in Higher Education), organised and administrated through the British Council, which provides similar partnership programmes and links between universities in the UK and developing countries. This scheme has enabled some co-operative research and training, however, the funding level needs to be considerably increased with clearer rules and mechanisms for its administration if it is to have a significant impact.

Outside of exchange schemes, which provide valuable assistance, current systematic UK support for training in developing countries is very limited. Other nations spend millions on the growth of advanced studies and research in developing countries. Italy is the major contributor to the Abdus Salam International Centre for Theoretical Physics (ICTP), which provides support and fosters capacity for physicists and mathematicians in developing countries. The advantage of this enterprise is that participants have regular visits to Italy but do not stay in the developed world, thereby helping to retain the science base in the developing country. France also has strong links with a number of countries and organisations, including the Tata institute in India, and funds the International Centre for Pure and Applied Mathematical Sciences (CIMPA) in Nice. One of the few UK bodies to incorporate within its mission the assistance of developing countries is the International Centre for Mathematics in Edinburgh. This institute has however found it difficult to attract the necessary funds to really make an effective contribution to developing countries.

DFID could further support the training of individual scientists in developing countries by contributing to the Global Change System for Analysis, Research and Training programme (START). This programme is a system of interconnected regional research networks jointly sponsored by the IGBP, the International Human Dimensions Programme (IHDP) and the World Climate Research Programme (WCRP).

An area that has vast potential to provide researchers from developing countries with access to information is to make available new information technology such as the Internet. This can help scientists to remain in their own countries to undertake research projects and offers possibilities for distance learning

and supervision for students. We recommend that the funding to develop and install this technology in research centres and institutions in developing countries be substantially increased. We also consider it important to involve publishers and UNESCO to facilitate development in this important area.

In post conflict situations new challenges are presented in monitoring the long-term health and environmental consequences. For example, the Royal Society report (2002b) highlighted that contamination of the environment and food chain could occur from depleted uranium (DU) and would require monitoring of water supplies over periods of more than 50 years. Knowledge of the immediate threats from DU has been significantly improved by international assessments, but the focus on the short-term means little is understood of the processes involved. Continued monitoring for contamination is therefore important and needs to continue over several decades, alongside establishing the capacity to do this within the affected country.

One of the most significant development issues is access to clean water. Systematic studies are needed to protect supplies. Good practice, supported by the World Health Organisation Drinking Water guidelines (WHO 2003), suggests that groundwater resources should be monitored by an appropriate authority for a wide variety of potentially toxic substances. A lack of attention to systematic development of such key areas of competence within the developing world is clearly demonstrated by incidents such as the arsenic poisoning in Bangladesh (WHO 2002). Encouraging and promoting this doctrine of long-term systematic monitoring, requires applied training supported by investment in scientific and technological infrastructure, to help the country undertake the research itself.

*November 2003*

## Annex 1

### ROYAL SOCIETY/THE NATIONAL RESEARCH FOUNDATION SCIENCE, ENGINEERING AND TECHNOLOGY PROGRAMME 1996–2004

International grants, funded by the Royal Society, enable high calibre scientists to move to and from the United Kingdom to initiate collaborations, exchange ideas, gain new skills and experience and link centres of excellence for scientific research.

The Royal Society and the National Research Foundation (NRF) (South Africa's national agency responsible for promoting and supporting basic and applied research as well as innovation) are supporting a joint programme of scientific exchanges between the UK and South Africa, the main aim of which is to assist a number of historically disadvantaged universities to develop expertise and excellence in selected areas of science, engineering and technology. Funding for these particular projects will end 2004–05, but we are hoping to introduce new projects to this programme. The Royal Society administers the scheme on behalf of OST and the NRF administers the scheme on behalf of the Ministry for Arts, Culture, Science & Technology.

Collaboration takes the form of pairing between each South African university department and a group in the UK, with complementary project leaders who undertake the planning, execution and budgeting of an agreed programme over a five-year period. Participating South African universities were selected by the then Foundation for Research and Development (the predecessor to the NRF), and the Royal Society identified relevant UK leaders in their fields. Funding from the UK side is provided partly from the Parliamentary Grant and partly from the Rhodes Trust. In South Africa contributions are made by the universities and by NRF.

The agreed objectives of the joint programmes are to:

- Increase the number and quality of black researchers (from undergraduate through to postgraduate level) and lecturers in Science Engineering and Technology in South African Universities.
- Improve access of black staff in the South African higher education sector to UK research and research institutions.
- Establish centres of excellence in historically disadvantaged universities through the assistance of UK experts.
- Encourage collaborative research projects between centres of excellence between UK and South Africa.

The Royal Society and the National Research Foundation cooperate to share costs to develop bilateral networks, on the principle of the sending side paying for international travel and the host side paying for local subsistence, including in-country accommodation, food and travel. The Society also supports exchange visits with South Africa outside of the Royal Society/NRF Programme.



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**APPENDIX 61**
**Memorandum from Professor Jeffery Burley**

For 20 years I was Director of the Oxford Forestry Institute and Professor of Forestry at Oxford University. During this time I advised ODA/DFID, the World Bank and several other international and national organisations. I am currently Immediate Past-President of the International Union of Forest Research Organisations, having served as President for the period 1996–2000. I am also Chairman of the Commonwealth Forestry Association, the Tropical Forest Resource Group and the Marcus Wallenberg Prize Selection Committee. My views therefore reflect considerable experience and awareness of forest-related issues in developing countries and the roles of research and education in meeting global development challenges; they also reflect considerable discussion with the members of such organisations. However, they do not purport to represent a formal collective view of any of the above institutions.

**CURRENT ISSUES IN GLOBAL FORESTRY**

In the last decade there has been increasing public and political awareness of the multiple roles of forests in providing economic, environmental and social benefits and services for the welfare of people, their domestic animals and their environment. There have also been local, national and international attempts to develop systems of managing forests to produce these benefits on a sustainable basis. Most development agencies and many developing country governments have recognised the importance of these roles and management systems; however, they have failed to recognise the place of innovation and research in solving problems associated with them, nor have they planned to integrate research with development and application.

Much research on biodiversity and climate change has been financed from outside the traditional forestry sector but the proportion of support for strategic and applied research on forest ecosystem management and use has declined significantly. The emphasis in the last decade on poverty alleviation and social participation in resource management has eroded the capabilities in the UK and other developed countries, as well as in the developing countries themselves, to undertake the still needed biophysical and managerial research. Further, the withdrawal of governments from production forestry and the contemporaneous reduction in commercial companies' research investment have led to a decline in capacities to support this industrial sector that can itself have a major impact on rural livelihoods as well as national, industrial, economic development.

Forestry is a long-term enterprise and personnel change frequently during their own careers and during the life-time of a forest programme. This applies to UK-based researchers, UK-financed development assistance staff, and local staff in developing countries. There is thus a critical need for a cadre and career path for these three types of personnel and also for an open, comprehensive, integrated and well publicised system for the maintenance and dissemination of records of research and forest management, particularly as electronic methods become affordable, compatible and widespread.

**THE UK SITUATION**

In the second half of the 20th century the UK was noted among other developed countries for its contributions to economic development in its former colonies and in other developing countries. DFID and its forerunners were particularly applauded for their work in natural resources management generally and in both industrial and rural development forestry particularly. British universities were noted for their education and research related to forestry in developing countries. The Oxford Forestry Institute was a world leader in academic education and professional training in forestry and in research on many relevant subjects together with the collection and dissemination of the world's forestry literature.

In the past five years these activities and reputations have declined significantly as the sources and amounts of overseas development funds for forestry decreased, the directions of research changed from biophysical to socio-economic subjects, and the national research councils failed to support the more applied subjects such as forestry. The mass of appropriately trained and experienced staff for forest management, teaching and research is currently small and in danger of declining to the extent that UK will be marginalised in attempts to influence the policies, programmes and capacities of international agencies and developing countries. Although laudable attempts are being made to incorporate small forestry modules in many university courses on environmental science, anthropology and geography, there is a grave danger that soon there will be few professional courses that can provide graduates with the integrated skills that DFID will require. It is clearly not DFID's role to provide such courses but statements of manpower requirements would support those university departments that do wish to offer such education.

Although forest researchers do not wish to set forest policies they do hope that such policies will be based on the recognition by decision-makers of the likely impacts of their policies. The UK could regain its pre-eminence by a better integration of its own research, education, training and extension skills; in turn, this would benefit by the strengthening or re-establishment of centres of excellence that have declined or narrowed their specialisation. This would also require a clearer recognition of the benefits of interdisciplinary approaches to research and implementation despite the common pressure on university departments to satisfy, the narrow criteria of scientific excellence used in research quality assessments.

While DFID and other British assistance organisations must continue to recognise the need and value of policy-driven research, they should also encourage new proactive and strategic research. However, there is also a pressing need to ensure the secure archiving of previous research efforts and existing information. It is vital that current researchers have access to details of the last half-century's research activities and to the formal and "grey" literature resulting from them. The Global Forest Information System led by IUFRO, CABI and the Oxford Forest Information Service, is a good example of modern attempts to make global sources of information compatible and accessible to all electronically so that unnecessary duplication of earlier research does not occur; support from DFID for this type of international collaboration would have significant mutual benefits.

In its attempts to build research capacity in developing countries DFID formerly supported professional, specialised training courses both in the UK and in individual countries or regions. Throughout the 1990s this declined but it should be revitalised as a cost-effective method of strengthening human resource development, the integration of science and technology in the development process, and the international reputation of the UK in this field.

November 2003

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## APPENDIX 62

### Memorandum from Professor David J Bradley, London School of Hygiene and Tropical Medicine

1. This is a personal submission from someone involved in health research for development over 40 years and a member of the DFID committee that produced the recent policy paper *Research for Poverty Reduction*. Several issues not adequately addressed there need to be raised if the select committee is to do its work successfully, and it may be helpful if they are raised by an individual. Further details of my involvement and experience in research in relation to development policies are the annex to this submission. My comments bear on paragraphs 2, 3, 4, and 6 of the Committee's terms of reference. They are much influenced by close involvement in and observation of research in relation to policy and practice for development, especially for health, nationally, across Europe, and globally.

#### SUMMARY

2. My comments concentrate on the effective deployment and maintenance of UK expertise for the benefit of developing countries and for their research capacity. In the short term the UK needs to use the research expertise it has more effectively with developing countries. This is a matter of devolving responsibility and providing resources. For the longer term, and contrary to DFID's recent lack of interest in the matter, there is a need for the UK to fully accept responsibility for maintaining its own expertise and so its ability to help effectively.

#### PROVISION OF SCIENTIFIC ADVICE

3. DFID (and its precursor ODA) have used many ways to support development-related research, and to gain expertise and good advice in health related aspects of development over the years (described in annex 11 of *Research for Poverty Reduction*), evolving over several decades towards an effective and highly integrated system in the period immediately before reorganization. It is to be hoped that the new system will somehow preserve the strengths of the previous system. It is the wish of DFID to influence international policy and research policy; but the ability to do this depends in part upon the UK reputation for expertise, which has been high.

4. There is a UK (and DFID) responsibility for maintaining and developing UK expertise in the broad field of international development and specifically in research in the applied aspects of health and development. This is because (a) progress towards development, and the millennium development goals, depends on more such expertise worldwide and (b) for the richer countries the only source of resources to maintain that expertise in the medium run are those countries themselves. It is simply unrealistic to expect either the Netherlands or Uganda (for example) to maintain British expertise and ability to contribute to the development process. Moreover, British ability to contribute to and influence the international development agenda constructively is dependent on its levels of expertise and research reputation.

5. The idea that DFID can simply “buy in” research as needed is naive and fails to understand the nature of the linkage between research, expertise, and sound advice. The links between applied research and policy depend on building up trust between researchers and policy-makers which depends in turn upon a shared vision and interactions over many years. While more basic research (eg developing the first vaccine against a disease) can be somewhat removed from those involved in assisting development, the myriad steps, from the first efficiency trial to an operational programme of disease prevention that is sustainable requires a close interaction between research, expertise, experience, policy making, and effective policy implementation into practice.

6. Moreover, because the ability to compete successfully for research contracts is, in the medium term, dependent on the scale of core funding of the researchers, failure to acknowledge the need for maintaining a core of research expertise in the UK would in the medium term result in DFID sources of expertise and research being from the USA, which recognises the need to maintain its expertise. While basic science expertise is widely spread in the UK science base, for historical reasons DFID has been responsible for maintaining the applied health science base of expertise and research experience, to which it has turned for advice as well as for applied and operational research data. The recent reluctance of DFID to continue to accept such responsibility needs either to be modified, or the relevant resources transferred to organizations able to take that responsibility.

#### RESOURCES FOR RESEARCH AND RESEARCH CAPACITY STRENGTHENING

7. There should be an increase in development research and research capacity strengthening funding, proportional to the overall aid budget. At present there seems to be a reluctance to accept this, which is a very short term response to what are very long-term needs. Where a short-term view pervades development issues it is a recipe for short-term failure and long-term chaos. The successful major health projects have been those, such as onchocerciasis (river blindness) control where some 18 per cent of the budget was put into applied research, solving problems before they became disasters. By contrast, malaria eradication attempts that aimed solely at short-term action, failed because problems were not being solved ahead of need. Research is, at its more basic end, a high risk and high payoff activity. And the benefits have been huge: contrast the polio vaccination (and possibly even eradication by vaccine) scene of the last several decades with the nightmare of having to consider iron lungs for populations in developing countries! But more applied research has a lower risk but still very high payoff in tackling health and other problems of poverty-afflicted people by low cost methods. Moreover a clear commitment to a proportionate expenditure of the aid budget on research would apply the necessary encouragement to governments to tackle two areas where DFID has not utilized its potential and has needlessly lagged behind some other countries.

#### RESEARCH CAPACITY STRENGTHENING (RCS)

8. The first of these is in research capacity strengthening, where the huge opportunities for building research capacity that derive from British academic commitment, and more specifically that have been opened up by the DFID research programmes, have not been taken up adequately by DFID. This is partly because of the very short-term focus of much of DFID thinking, and partly for reasons discussed in the next section. In many international initiatives, DFID has been initially a strong supporter and funder for the first few years but then diminished support. By contrast, Nordic countries have been prepared to plan on a nine to 15 year horizon for research capacity strengthening for developing countries, and have used their Scandinavian institutions to manage these activities. The DFID research programmes, in Health at least, have extensive and deep links with developing country partners, and would be able to do a thorough job of building up such tropical institutions were funds available to them for research capacity strengthening, so building up the ability of developing countries to solve their own researchable problems.

9. Research capacity strengthening, if it is to succeed, needs to be long-term and to combine education and training of individuals with institution-building. Partnerships between research workers and institutions of different countries (here explicitly UK and developing countries), if they are long-term and mutually beneficial, can be crucially important. Past DFID support has enabled the development of a group of research workers committed to development of public health and health research in and with developing countries. Given access to appropriate resources they can be enabled to build capacity efficiently in developing countries. A beneficial side-effect of such an approach is to raise the status of highly applied and operational research in developing country universities.

#### SCIENTIFIC TRAINING

10. It is increasingly difficult to obtain funding for training for developing country research workers leading to UK PhDs, and so for UK expertise to be transferred through research supervision. There is a catch 22 situation: DFID and other funders find the UK PhD for many overseas candidates is too expensive. However the UK Research Assessment Exercise (RAE) gives no credit, and university staff get no support for supervising students registered in developing country universities, while insecurity of staff finances and pressures from UK organizations also pull in the opposite direction. This is a soluble problem, given sufficiently clear policy.

#### COUNTRY LEVEL RESEARCH AND RCS

11. A major problem in DFID aid for research, and in supporting research in-country and by developing country nationals, is the division between bilateral aid funds and central (policy division) funds. This has for many years been a difficulty (one might feel that this division was more in need of attention than the reorganization that was undertaken in policy division) and because research is essentially labour-intensive, research capability strengthening will not emerge strongly in the present situation.

12. In practical terms, programme managers at a regional and country level in DFID have gained a short-term perspective focused on the Millennium Development Goals. This cannot sit comfortably with long-term labour-intensive research management and research capacity strengthening (RCS) management. It would be better to handle such funds through research collaborators and to put the scientific management of RCS with DFID research programmes and other UK research groups. There are very successful Swiss and Scandinavian examples of this approach. The Swiss, for example, have recently made academic organizations partly responsible for RCS for defined geographical areas across disciplines

*November 2003*

**Annex**

#### RELEVANT BACKGROUND EXPERIENCE

Professor David J Bradley MA, DM, FRCP, FRCPath, FFPHM, FIBiol, FMedSci, HonFIWEM.

Ross Professor of Tropical Hygiene at London School of Hygiene and Tropical Medicine since 1974.

Member of the Surr committee (Research for Poverty Reduction) but felt it failed to address key issues because constrained by the perceived preconceptions of the then Secretary of State.

I completely support the LSHTM submission, but feel there are issues that are not easily made there which should be nevertheless raised.

Member of HPACORD (DFID Health and Population Advisory Committee on Research and Development) for its entire existence 1990 to 1999.

Member of MRC Tropical Medicine Research Board for approximately 12 years until its dissolution, then of MRC grants Committee.

Formerly member of Wellcome Trust Tropical Research Grants Committee.

Head of DFID Tropical Diseases and subsequently Malaria Research/Knowledge Programmes at LSHTM since their inception until 2000.

Resident in Tanzania for two years (National Institute for Medical Research) and Uganda eight years (Makerere University teaching and research staff; then Tropical Research Fellow of the Royal Society) and with continuing involvement overseas since 1961, spending about 3 months overseas each year since 1974.

Rapporteur to the committee that set up the WHO Tropical Diseases Research Programme, and subsequently member of its external reviews and of committees of WHO that set up at Diarrhoeal Diseases programme etc. Board member and Chair, International Centre for Diarrhoeal Diseases Research, Bangladesh (ICDDR,B). Member of the Research Capacity Strengthening Committee of WHO and of WHO ad hoc Committee on Medical Research.

Chair of external review committees of the Swiss Tropical Institute, University of Heidelberg Federal Tropical Diseases Programme, Royal Tropical Institute of Netherlands, Antwerp Institute of Tropical Medicine, Danish Bilharziasis Laboratory.

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#### APPENDIX 63

##### **Memorandum from Stephen Biggs**

I have been involved in activities to strengthening technology and institutional innovation systems in Nepal since the late 1970s. These comments are based on contact with UK government programmes over

the years as well as contact with many international natural resources/agricultural research programmes. For example institutions of the CGIAR system to which the UK has made a financial contribution for many years.

There are a number of issues that I would like to bring to your attention.

(1) *The conflict of interests.*

There sometimes exist conflicts between the goals and rewards for UK researchers working in Nepal and the current needs for strengthening national and local level innovation systems in Nepal. For example, publishing an article in a UK/International respected journal at the end of research project may be a major goal for the UK (and Nepali) researchers, however, the process by which the research was carried out in Nepal may or may not have made much contribution to strengthening local capacities. In addition the processes may not have been cost effective in quickly giving rise to finding and developing useful innovations. In any assessment of new UK/Nepali partnerships in research, there needs to be an assessment concerning the way the research project/collaboration will lead in the short term and in the long run to increased innovation capacity here. In log frame language, this needs to be included in the goal/purpose level of the project/partnership, and be monitored from the start of the exercise. The contributions to building local capacity need to be tangible and monitored from the very start. This of course raises the issue of what does one mean by strengthening local innovation systems. In Nepal there are plenty of examples of where good Nepali researchers have fostered and nurtured applied and basic (plant breeding) research towards addressing today's problems of poverty reduction and to building sustainable innovation systems. One example, is the work of a large local NGO called LIBIRD. Some of this work has been done with effective support from UK institutions. There are other cases of where partnerships with UK research institutions have also led to the production and spread of useful technological and institutional innovations, and to the strengthened of the overall national and local innovations systems.

(2) *Co-ordination across research and development programmes/projects.*

In Nepal a major problem is the persistent problem of "parallel" research and development strategies, programmes, and projects. Sometimes they are in the same subject/sector, and on other occasions they are across sectors. Sometimes in the past UK/international funded research has been party to these types of "parallel" research and development activities. Again it is an issue of incentives and rewards for those involved. Programme/project assessment methods that encouraged awareness of what others are doing and then rewarded relevant and useful partnerships would help reduce this tendency. Competitive grant systems in both the UK and in Nepal do not necessarily reduce this behaviour, in fact they can encourage it.

(3) *Review of UK's contribution to strengthen innovation systems in Nepal.*

In Nepal there has been a long history of the UK being involved in natural resources and agricultural research. Before one could make any assessment of the long term effects of past funding, one would need to commission a broad-ranging overall assessment, not only of the effects of this research and development on current livelihoods and poverty reduction, but also the effects on social inclusion and employment in the society, and the effects on the strengthening of national, regional and local level innovation systems. The UK funding of the CGIAR system and other research projects in Nepal would need to come under this assessment.

Because of the long history of the UK working in Nepal on natural resources and agricultural research and development issues, such a review could lead to some useful suggestions for how innovation systems here might be strengthened in the future. I am not thinking about a large expensive study, but one which would be cost effective as regards being of use to any donor that might be considering new and effective partnership methods for working with the government, NGOs and the private sector. It would need to concentrate on poverty reduction/livelihoods, empowerment and social inclusion issues as they relate to natural resources, rural development and agriculture. This is especially important at this time, when membership of the WTO is about complete and this is bringing with it a whole range of different S&T challenges and opportunities in Nepal.

November 2003

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## APPENDIX 64

### Memorandum from Prospect

#### INTRODUCTION

1. Prospect is a TUC affiliated union representing 105,000 scientists, engineers and other professional and specialist staff in the Civil Service, research councils and in the private sector. We have approximately 150 members at NR International, the Natural Resources Institute and elsewhere within the University of Greenwich. We also represent substantial numbers of scientists at Horticulture Research International, CAB International, the Department for Environment, Food and Rural Affairs (DEFRA) and its agencies,

and the Department for International Development (DFID). Prospect has become very concerned about the changing emphasis within DFID on the role of science in informing development policy and has prepared this submission using the expertise and first-hand experience of members in this field.

2. Prospect, and its predecessor union IPMS (the Institution of Professionals, Managers and Specialists) has a long track record in this area, having given evidence to a Parliamentary inquiry as long ago as 1982–83. The report published by the Foreign Affairs Select Committee at that time concluded that the scientific units involved were widely respected and needed by developing countries and by international agencies, that the cuts being imposed at the time would probably be irreversible since the core of specialist expertise would have been dispersed, and that the major efficiency scrutinies were fundamentally flawed. It recommended an increase in resources to deal with a rising volume of problems and challenges. In Prospect's view, these conclusions are as true and necessary now as they were twenty years ago.

3. Yet our members' assessment is that DFID's ability to formulate policy on the basis of scientific evidence is being steadily eroded by changes in the department's organisational structure, and that insufficient attention is being paid to developing a comprehensive, balanced research portfolio. The following paragraphs address the specific issues raised by the Select Committee. We should be glad to provide further evidence in support of our arguments and would welcome an opportunity to discuss our concerns in oral evidence.

*The co-ordination of research support with Government policy on the use of science in development policy, taking into account the work of the Research Councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID.*

4. DFID can, and does, call on specialist advice from other Government Departments, Research Councils, universities, private sector companies and consultants to provide advice on scientific, engineering and technological matters. However, some of the key bodies in this field—notably HRI, CABI, BBSRC's Rothamsted Research and the Natural Resources Institute—are currently facing major difficulties:

5. *Horticulture Research International* (HRI) was established in 1990 from the Institute of Horticulture Research (part of the BBSRC) and 3 MAFF Experimental Husbandry Stations. Its remit was to improve the profitability and sustainability of UK horticulture and to support the improvement of farming and horticulture in developing countries. Over the past 13 years HRI has built up an enviable reputation around the world for its strategic science and its applied agronomy, particularly in the third world. This has included the breeding and development of crops suited to arid or tropical climates and the development of husbandry techniques to protect the environment whilst maintaining livelihoods in poor communities.

6. In 2002 HRI's parent department Defra, announced a quinquennial review of the organisation and its future position as an R&D provider. The review concluded, in early 2003, that HRI should be broken up and removed from Defra management.

The Wellesbourne and Kirton sites are to transfer to the University of Warwick, the Efford site (specialising in perennial crops) is to close, and the East Malling site is to be transferred to a charitable trust. In addition 200 posts will be lost, two thirds of which will be scientists. Inevitably such major changes will disrupt research programmes, but even more damaging will be the loss of world-renowned individuals and research groups that will have a major impact on the overseas programmes. It is not clear whether Warwick University will be willing or able to sustain the overseas programmes operated by HRI and it is certain that a drastically reduced East Malling Research will not have the critical mass to make development work a core part of the new business.

7. Similarly, *Rothamsted Research* is also going through major change with the closure of its world renowned Long Ashton Research station and the loss of a further 200 posts, which will severely impact on the development work of the Institute in the short term.

8. The *Natural Resources Institute* has had its staffing level reduced from around 550 20 years ago to 300 at privatisation and just 107 in November this year, 45 of whom are scientists. The age profile of the remaining staff is of concern in relation to future sustainability of the work as many younger staff have been made redundant and there is currently almost no recruitment of young scientists. There have been successive rounds of cuts, leaving many staff reliant on securing grants to continue their work. The cuts have led to some loss of functions and a reduced ability to respond to requests for work in some areas. These include remote sensing, geographical information systems, fisheries science, biodiversity and wildlife management, pesticide residue analyses, forestry, environmental impact assessment, fresh produce conservation and medicinal plant science. In addition, it is worth noting that NRI is the only one of these bodies with a core mission to work on international development issues but it is no longer core funded to do so. Whilst it is has successfully co-ordinated inter-disciplinary research from a range of sources, its work is suffering badly as a result of inadequate funding. Stable long-term funding is essential because the problems facing less developed countries require long-term solutions, not stop gap remedies. There is a more detailed account of NRI's troubled history over the past 20 years at Annex 4.

9. Prospect believes that DFID should maintain a co-ordinated research programme for supporting interdisciplinary research into the sustainable management of natural resources in lesser developed countries and for capacity building in science, technology and engineering. A research institute dedicated to these aims should be supported with core funding, as should related institutes, eg those concerned with

the health of the developing world. The maintenance of a strong UK science base is the only way in which solutions to the ever-increasing suite of problems that afflict both developed and less developed countries alike will be found. In an era when so many members of a burgeoning world community are forced to live in poverty, and in degraded and degrading environments, policies based on sound science and administered by governments that understand the requirements for improving the quality of life in urban and rural communities are essential.

*The means by which DFID acquires and uses scientific evidence in developing and implementing its policies and programmes*

10. The Government recognised the importance of knowledge in achieving DFID's aims in its 1997 White Paper on International Development which stated that: "Knowledge, research and technology underpin all our work. The elimination of poverty and protection of the environment requires improved access to knowledge and technologies by poor people. This will be achieved through continued investment in research and research capacity in developing countries and through partnerships with the science community in the UK and internationally. The outcomes of this research will be disseminated widely so that the maximum benefit can be derived from it." Similarly the 2000 White Paper on International Development stated the Government's intention to focus more of the UK and global research effort on the needs of the poor.

11. However, the decision in 2001 to "untie" aid may well prove damaging, not least because other European players generally recognise the benefits of retaining their own expertise. Prospect's view is that the UK science base can compete and will win contracts if they are assessed in an open and transparent manner and on a basis that is fair. However, access to public funding is essential to maintain impartiality and objectivity and public science of this kind must be supported as an asset to the UK. The reality though is that DFID effectively gives core funding to international agricultural agencies but not to UK institutes. No other EU or OECD country is divorcing itself so dramatically from its own talented researchers. The confusing relationship between DFID and the UK science base is demonstrated by the process by which it is now using the UK scientific expertise in an unpaid capacity to provide it with ideas for its new research strategy (see Annex 1). This also indicates that the current Central Research Team is relatively inexperienced in science and technology, particularly in the technical aspects of the medical and agricultural sectors and suggests that they are unable to develop a coherent strategy on technical issues without assistance from UK scientists. We suggest that the UK Government should review its position on the untying of scientific advice to DFID.

12. An added contradiction arises from the fact that UK intellectual property is being requested as inputs to the CRT's new research strategy (for free) although DFID has repeatedly stated that its development assistance is untied and recently suggested that it could be distributed via non-UK scientists working in developed countries such as Canada. Prospect considers that this reflects DFID's attitude towards the UK research community and its less developed country partners, and its lack of appreciation of how research needs are identified and prioritised. Prospect endorses the conclusion of the 8th Report of the International Development Committee (IDC) regarding agricultural policy. The IDC report stated that "The Committee is concerned about what it sees as DFID's lack of a coherent strategy for agriculture and calls on DFID to do more than simply seek to create an "enabling" environment in which agriculture may flourish. We consider that DFID should aim to boost smallholder production, arguing that helping small farmers to produce more food is a more cost-effective policy than food aid." Prospect also regrets the omission of any mention of either the RNRRS or of NRI in DFID's response to the IDC's queries on agriculture and deplores DFID's rejection of the IDC's suggestion for developing an agricultural strategy. The lack of a coherent agriculture strategy will nullify the ability of UK science to provide assistance and integrated solutions to crop management problems from sowing to storage.

13. It is also the case that DFID's capacity to act as an intelligent customer has been weakened. In the past, DFID's Natural Resources Division (later named the Rural Livelihoods Department, RLD) had a Chief Natural Resources Adviser to co-ordinate diverse inputs from many sources and provide interdisciplinary scientific advice to the Minister. There is no longer such a post, the responsibility apparently being covered now by the Chief Environment Adviser, and neither is there any senior post to inform specifically on agricultural issues and their impact on the MDGs. Many of the RLD staff have been absorbed into policy, administrative or management roles or country offices or have retired without being replaced. Some (approximately 30) of these specialists who have been employed at DFID HQ or in country offices at one time or another, were formerly employees of the Natural Resources Institute or were seconded from it. Furthermore, the lack of a Chief Scientific adviser at DFID is at variance with recommendations from the Office of Science and Technology's (OST) cross-cutting review of science and research published in July 2002. Prospect is also concerned that DFID is not taking positive steps to implement measures suggested by the OST to "ensure that science priorities are carefully considered and given proper weight alongside other priorities in spending decisions" and "improve the competence of departments to act as an intelligent customer for, and manager of, research and scientific advice".

*The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes.*

14. It is worth noting that although there has been no overall review of DFID's Renewable Natural Resource Research Strategy (RNRRS) (see paragraph 12), a preliminary review of selected agricultural research themes was commissioned by DFID in 1999, when DTZ Pidea Consulting concluded that "There is considerable evidence to suggest that the agriculture programmes of the RNRRS are achieving substantial economic impact and working directly towards elimination of poverty. The implementation of research findings of direct benefit to millions living in poverty will help sustain rural livelihoods in the countries concerned. The achievements to date are only part of the story and benefits continue to accrue not only in the countries where the research activities have been based but also in many other countries that stand to benefit from the uptake of the findings." Many of these achievements have led to major successes in the implementation of evidence-based policy, derived from research largely or wholly sponsored by DFID, many stemming from expertise at NRI in collaboration with partners in developing countries. Two examples are:

- Government of India policy changes on use of Integrated Pest Management in cotton (2002). Fifteen insecticide resistance monitoring laboratories were set up for a project liaising with 3,500 farms and led to a 56% reduction in insecticide use, a 13% increase in yields and a 74% increase in profitability; and
- Control of Larger Grain Borer has led to reduced losses of cassava and sorghum in stores, improved food quality, a reduced need to sell early at low prices, and reductions in the need to secure alternative food supplies.

Other examples of successful research outcomes are set out in Annex 2.

*The ways in which the role of the UK private sector and public private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced.*

15. The management of substantial parts of DFID's Renewable Natural Resources Research Strategy (RNRRS) was devolved to Natural Resources International, a company set up in 1996 after the privatisation of NRI. [Note: The Natural Resources Institute (NRI) is often confused with NR International but the two organisations have very different functions. NRI is concerned with research provision and NR International with research management.] The RNRRS will end in March 2005 and DFID has yet to decide what natural resources research it will continue to support and how it will be managed in the future. To date, there has been no overall evaluation of the RNRRS and few of the other knowledge programmes encompassing subjects such as health have been reviewed. We understand that a new research strategy is to be introduced but we are concerned that, given the lack of reviews and the lack of consultation with partners in less developed countries, this will not be based on evidence of demand or effectiveness. There is a suggestion that greater emphasis will be placed on social and economic issues at the expense of science, yet it is widely recognised that the best development programmes are interdisciplinary combinations of science, social inclusion and economics conducted in close collaboration with in-country partners.

16. Our understanding is that current thinking at the centre of DFID is that research funds may be allocated to DFID country programmes but "not for research per se" or that a research programme may be commissioned from the Canadian Government's International Development Research Centre (IDRC), amounting to £5-£10 million. However, it is not clear what the advantages of using the IDRC would be or why such a substantial investment of public money should be made in the development body of another developed nation. It may well be that there is a lack of appreciation of the current situation in the UK, which in fact involves very significant involvement by research councils with the RNRRS programmes. For example, representatives of bodies supported by NERC, DEFRA and BBSRC sit on the programme advisory committees of most of the RNRRS research programmes and staff of bodies such as Rothamsted Research and Horticulture Research International are regularly engaged in RNRRS research projects and other DFID-funded activities

17. We are also very concerned about the continuing adverse consequences of privatising the Natural Resources Institute which, since 1996, has been part of the University of Greenwich (see Annex 4 for history of NRI during the last twenty years). As mentioned, NRI receives no core funding and staff now rely on securing contracts to cover their full economic costs (FECs). This equates to a rate of about 120% of salary costs compared with a maximum paid by research councils of around 46% for overheads. The daily costs range from £241-£784 depending on grade and include salaries, national insurance and pension contributions, facilities bills and, most exorbitant of all, rent to meet the costs of the staff being housed in refurbished listed buildings in Chatham. These financial manacles, imposed as part of the privatisation agreement and earlier financial impositions by ODA, have led to a spate of redundancies and threaten the survival of the institute. The high costs that the Institute needs to charge clients to cover its FECs has limited its ability to secure funding from Research Councils, the EU and other donors. One successful BBSRC grant had to be turned down, partly on cost grounds. Not only is NRI expertise currently too expensive for the UK development science community but also, together with its institutional memory and documentary support, it is being lost as a resource for the EU as well. Most EU development institutes receive core funding



and the NRI costs could become competitive if sufficient core funding was restored by DFID. Such funds would provide support equivalent to those of other UK scientific institutes (all of which receive core funds from one source or another) and ensure the continuation of a long-term research capacity, particularly in agriculture and horticulture, within the UK for overseas development science.

*The extent of scientific and engineering training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

18. Most DFID-sponsored projects involve working with in-country partners and, even if not specified in the terms of reference of a project, training takes place and institutional scientific capacities are built as a direct result of informal links. Formal training courses and workshops are also commonplace in such projects in addition to training leading to a named award or degree. Training may take place overseas or personnel from less developed countries may travel to the UK for their studies. Some obtain sponsorship from their own governments or UN agencies and the UK British Council, the Association of Commonwealth Universities and many other bodies award scholarships. Such capacity building takes place in universities, colleges and other institutes throughout the UK.

19. A fundamental role of a science or engineering department within a university is to transfer the skills and expertise of its specialists to others. To be able to achieve training at the highest levels, it is essential that a skill-base be maintained that can remain up-to-date with the latest developments in the appropriate subject area. This is just as important for subjects related to development as it is for nuclear physics, nanotechnology or the development of gene therapies. This is well recognised by the French Government that maintains a cadre of 1,800 employees at CIRAD. CIRAD is the French scientific organization that specializes in agricultural research for the tropics and subtropics world-wide. Half of its employees (900 people) are senior staff, working in some 50 countries contributing to development through agricultural research in developing countries.

20. The ODA and DFID have supported training by financing training courses and scholarships, such as those administered by the Association of Commonwealth Universities (ACU), as well as by direct support to scientists through their projects. The impact of training in UK institutions in terms of affecting policies in developing countries is substantial. For example graduates may take up high political positions as many Heads of State (eg the late Dr Hastings Banda of Malawi and President Assad of Syria) and Ministers have been educated at UK universities and many have studied science or medical subjects.

21. NRI is renowned for providing practical training, often as adjuncts to academic projects, and often collaborates with other institutes in overseas training projects. For instance, the post-harvest unit at HR International's East Malling Station worked with NRI staff on a collaborative project on post-harvest research in Zimbabwe and with staff from the HR International at Wellesbourne on onion projects. NRI has supervised PhD students from a range of less developed countries including Belize, Botswana, Cameroon, China, El Salvador, Ghana, Guyana, Kenya, Malawi, Nepal, Pakistan, South Africa, Sri Lanka, Tanzania, Uganda, and Zimbabwe. These students and many of the MSc graduates return to their countries to continue working in scientific capacities (see Annex 3) and appreciate NRI as a continuing source of advice. Thus such appropriate training continues to be utilised and does not contribute to the type of brain drain which concerned the IDC in its 8th report.

#### CONCLUSION

22. The UK science base has the expertise to provide DFID with appropriate advice to help it form policies on science, engineering and technology issues and to train scientific personnel from less developed countries. Through its Darwin Initiative programme, DEFRA promotes collaboration between the UK science base and overseas institutions to conserve biodiversity. We suggest that research and training which impacts on the livelihoods of millions of poor people should be accorded similar treatment by the UK Government. The current abilities within the UK to conduct research and training in support of less developed countries are based on substantial staff experience, largely supported by DFID, but this support is being dissipated by privatisation of government scientific institutes, the untying of UK aid, and the formulation of new research strategies with scant regard to past achievements.

*November 2003*

**Annex 1**

#### DFID'S PLANS FOR A NEW RESEARCH STRATEGY

DFID has set up a Central Research Team (CRT) within its Policy Division with the task of producing a new research strategy by December 2003. This process began with an invitation to experts in the fields of social and political change, health and well-being, and applied technologies to improve livelihoods for ideas for research on themes which would achieve the Millennium Development Goals. THE CRT has since held a series of public meetings and written or commissioned reports on six topics to inform the process of how DFID will work and decide its future research agenda. These are on DFID's website and are on the themes of in-country research; DFID's role in the national research effort; DFID's role in the international research effort; DFID's research strategy: leveraging private sector research; and new DFID research strategy

communications. The outstanding sixth report will be on promoting engagement with policy makers. There is no mention of the RNRRS or NRI in any of the papers and only passing reference to agencies currently managing the RNRRS.

## Annex 2

### EXAMPLES

#### EVIDENCE-BASED POLICY DECISIONS

- Introduction in Uganda of resistant varieties of cassava to combat a devastating epidemic of cassava mosaic disease, following request for assistance from the Government of Uganda in 1992;
- Bans on use of pesticides in rice in favour of integrated pest management methods in Indonesia in 1984 and the Philippines in 1987;
- Introductions of new varieties of sorghum that are resistant to the weed Striga in Tanzania approved for release by the Tanzanian seed authority in 2002; and
- A legal notice was issued in 2003 by Kenya notifying its intent to change its policy, as stated in the Pest Control Act of Kenya 1982, on bio-pesticides by actively seeking bio-pesticide alternatives to synthetic pesticides, in the light of research funded by DFID.

#### BENEFITS DERIVED FROM RESEARCH SUPPORTED BY THE RNRRS

- Improved silage production and storage leading to 50–100% increases in milk yields from cattle in drought-stricken parts of Zimbabwe;
- Doubling of profits by introduction of systems to reduce insect-infestation of fish produce in India;
- Improved yields of maize and firewood in Uganda through better management of trees such as crown and root pruning methods at the forest-agriculture interface;
- Development of locally made sunflower cake as a cheap substitute for conventional poultry feeds;
- Application of control methods to reduce losses to fish after harvest leading to an 18% increase in the value of fish produce in markets in Ghana;
- Multiplication of disease-resistant varieties of sweet-potato and their distribution to farmers in Uganda. In addition to yielding 2–4 times more than local varieties the new varieties are rich in beta-carotene and so provide a cheaper and sustainable means of combating vitamin-A deficiency (prevalent among young children) than supplements. This is a clear example of the many interdisciplinary links between agriculture and health;
- Development of pheromone technology to trap the Larger Grain Borer in stored grain and use of trap and environmental data to forecast when stores will become infested in Ghana;
- Identification of novel virus (pigeonpea sterility mosaic virus) causing pigeonpea sterility disease and development of a resistant varieties programme to increase yields and improve seed quality in the Indian sub-continent;
- Improved rat-trapping methods to reduce damage to crops and stored grain and reduce incidence of human diseases passed on by rats such as leptospirosis and plague in Mozambique;
- Development of environmentally-friendly fungal-based biological control methods and better international networks and forecasting systems against locusts and other migrant pests in southern Africa;
- Improved weed management systems for rice in Asia giving 10% increases in yield and 80% reductions in labour costs; and
- A successful fruitfly control scheme that reduces insecticide use by 95% in India.

#### NRI RESEARCH THAT HAVE IMPACTED ON OVERSEAS DEVELOPMENT

- NRI experts identified a major disease epidemic of cassava in Uganda before any other international agency. This led to their identification of cassava varieties resistant to a new virulent strain of Cassava Mosaic Virus. Introduction of the resistant varieties into Uganda led to interruption of a disease pandemic that had caused widespread famine (60,000 ha of cassava lost per annum). The benefit:cost ratio of the work was estimated to be 31:1;
- Insecticide resistance of cotton boll worm pests of cotton. Research by NRI scientists in India established that insecticide resistance was a major constraint to cotton production in India and appropriate integrated pest management measures were successfully introduced. This work was complemented by DFID India, and acknowledged by external consultants who recognised that

- NRI and Rothamsted International that provided good solutions. These were then taken up by the Common Fund for Commodities (CFC) for introduction to Pakistan and then by the DFID CPP for Uganda;
- Cassava Brown Streak Disease (CBSD) in Mozambique. This disease was identified by NRI scientists, supported by the DFID CPP, as being a major reason for severe crop losses and NRI staff have been the major international agency to offer NGOs and relief programmes advice on minimising disease spread in Mozambique. NGOs such as World Vision International have acknowledged the important support from NRI scientists to this work;
  - Development of odour-baited traps for tsetse fly control in Zimbabwe led to reductions of nagana (trypanosomiasis) in cattle from 10,000 cases per annum in 1985 to less than 100 in 2002 and transfer of the technology for use elsewhere in Africa;
  - Contributions to the eradication of screw-worm from cattle after the insects invaded Libya, thus protecting all of Africa's susceptible livestock from this scourge;
  - Contributions with research on blackfly biology and control to the success of (a) the WHO Onchocerciasis Control Programme in West Africa (OCP) in freeing 30,000,000 people from the threat of infection with river blindness, 150,000 from going blind and making available 25,000,000 hectares of tillable land capable of providing food for 17,000,000 people and (b) planning the WHO African Programme on Onchocerciasis Control (APOC) in Equatorial Guinea;
  - Development of pheromones for monitoring and control of cotton, millet and sweet potato pests;
  - Development of microbial insecticides for control of diamondback moths and armyworm moths, major pests of brassica crops and small-grain cereals, respectively;
  - Development of integrated pest management strategies for management of coffee pests and diseases in Malawi;
  - Isolation of plant products with potential use as drugs against bacteria, fungi and protozoa;
  - Introduction of successful Integrated Pest Management for pests of sweet potato in Uganda and Tanzania;
  - Successful weed control programmes in rice in Asia;
  - Management of Groundnut Rosette Disease that is transmitted by greenfly (aphids) by introduction of aphid-resistant strains instead of reliance on varieties with limited disease-resistance;
  - Identification and epidemiology of whitefly-borne tomato leaf-curl disease;
  - Successful integrated pest management of bean diseases in Malawi;
  - Forecasting of time and locations of breeding by red-billed quelea birds to improve control targeting in southern Africa against this major, migratory, pest of small grains and contributions to development of a regional migrant pest reporting system (ICOSAMP);
  - Promotion of sustainable livelihoods by establishment of a Mycotoxin Centre at the Institute of Food Science and Technology (IFST), Dhaka, Bangladesh; and
  - Development of diatomaceous earths as alternatives to insecticides for control of insect pests of stored grain.

### Annex 3

#### SCIENTIFIC WORK OF NRI STUDENTS

Many of the students enrolled on formal courses at NRI, leading to the award of a qualification have been professional staff from government departments seeking to improve their skills. Such students have then returned to their previous jobs, often in very responsible positions and able to influence policy in their own countries. Those who have studied at NRI and, where applicable their specialist areas of responsibility, include:

- Current Acting Director General, National Agricultural Research Organisation, Uganda;
- A member of staff of the National Environment Management Council (NEMC) in Dar-es-Salaam, Tanzania—bio-safety issues;
- Assistant Director Pakistan Science Commission, Islamabad—policy issues;
- Principal Environmental Management Officer, National Environmental Management Council, Dar-es-Salaam, Tanzania;
- Science and Stewardship Coordinator for the Toledo Institute for Development and Environment (TIDE), Belize;
- Policy adviser/crop specialist, Ministry of Agriculture, Seychelles;
- Director of Kisii Regional Research Centre of the Kenya Agricultural Research Institute (KARI), Kenya;

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- Plant Quarantine Officer, Ministry of Agriculture, Asmara, Eritrea;
  - Environmental Officer, Ministry of the Environment, Mauritius;
  - Plant Quarantine Specialist at Kenya Plant Health Institute (KEPHIS);
  - Marketing Manager, Cocoa Marketing Board, Accra, Ghana;
  - Bureau Head, National Logistics Agency, Jakarta, Indonesia;
  - Operations Manager, National Logistics Agency, Jakarta, Indonesia;
  - Head of Food Technology Department, National Logistics Agency, Jakarta, Indonesia;
  - Chief, Quality Control, Nepal Food Corporation, Kathmandu, Nepal;
  - Head of Food Technology Research, KIST, Seoul, Korea;
  - Deputy Director (Inspection), Ministry of Food, Dacca, Bangladesh;
  - Senior Inspector, Ethiopian Grain Agency, Addis Ababa, Ethiopia;
  - Director of Food Security, Protection des Stocks (OPAM), Bamako, Mali;
  - Assistant Director of Agriculture, Ministry of Agriculture, Jessor, Bangladesh;
  - Deputy Director of Food, Department of Food, Rawalpindi, Pakistan;
  - Assistant Food Commissioner, Food Commission, Colombo, Sri Lanka;
  - Professor of Crop Science, National Agricultural University, Lima, Peru;
  - Chief of Construction, Ministry of Agriculture, Bangkok, Thailand;
  - Chief Food Storage Officer, Ministry of Industry and Commerce, Kingston, Jamaica;
  - Director, Food Security, OPAM, Bamako, Mali;
  - Head of Plant Protection & Produce Inspection, Ministry of Agriculture and Livestock Development, Zanzibar, Tanzania;
  - Managing Director, Emergency Food Strategic Reserve, Addis Ababa, Ethiopia; and
  - Assistant Director, Sri Lanka Export Board; Regional Co-ordinator, ADRA (Adventist Development and Relief Agency) Ghana.

#### Annex 4

#### RECENT HISTORY OF THE NRI

Predecessor bodies to the NRI (the Centre for Overseas Pest Research (COPR), Tropical Products Institute (TPI) and the Land Resources Development Centre (LRDC)), together with the Department for Overseas Surveys (DOS), were subject to Parliamentary scrutiny by the Foreign Affairs Select Committee during 1982–83. (See the Fourth Report of the House of Commons Foreign Affairs Committee, session 1982–83, The Overseas Development Administration’s Scientific and Special Units)

Whilst the Foreign Affairs Committee was still conducting its inquiry, the ODA announced on 28 October 1982 that the COPR and the TPI would be merged to become the Tropical Development Research Institute (TDRI). The DOS became part of Ordnance Survey and, following an ODA announcement of 26 January 1987, the LRDC joined the TDRI to form a single unit entitled the Overseas Development Natural Resources Institute (ODNRI) and, subsequently, the Natural Resources Institute. Later, staff of the ODA’s Corps of Specialists were also added to the complement. The first Director of the TDRI, a scientist from TPI, was replaced on 3 February 1986 by Mr G Anthony Beattie, a career civil servant who had most recently worked for ODA advising on pensions. An ODA announcement on 4 October 1985 explaining Mr Beattie’s appointment stated that “This decision represents a departure from tradition and the aim will be for Mr Beattie to be succeeded in due course by an officer with a scientific background”. However, Mr Beattie continued as director of NRI until privatisation in 1996.

Staff of the ODNRI were re-located in 1988 to occupy premises that were previously part of the Royal Navy’s dockyard at Chatham. It had been argued that the cost of keeping ODNRI staff in premises in London, Culham and Porton Down was prohibitive because of the high rents. Alternative sites to Chatham, arguably more appropriate in terms of access to scientific colleagues in other institutes and for international links, were turned down as the priority was to fill the empty naval buildings. This is likely to have been a false economy: instead of one government department (the Ministry of Defence) donating its unwanted premises to another government department (the ODA), the properties became part of English Estates (now English Partnerships) to which rent had to be paid. The cost of the extensive refurbishment involved in transferring a naval mess into offices and laboratories was also a significant cost factor.

NRI became an executive agency of ODA on 1 April 1990 under the Next Steps programme and an ownership study was instigated. Proposals were developed by a consortium comprising the Universities of Greenwich and Edinburgh and Wye College of the University of London. A consultancy report followed and then recommendations from the Stewart Levene efficiency scrutiny of 49 Government establishments in 1994. On 20 December 1994 Alistair Goodlad, then Minister of State at the Foreign Office, told the House

of Commons that “Following the receipt of advice by consultants my noble friend the Minister for Overseas Development has decided that formal tenders should be invited to take over the future ownership of the Natural Resources Institute. The consultants report shows that there is widespread recognition of the high quality of work being undertaken at NRI. A number of universities have expressed interest in taking over, singly or jointly, the ownership of NRI. The Government welcomes this interest. We intend that it should continue to provide a centre of multidisciplinary expertise on the sustainable management of renewable resources. The Overseas Development Administration expects to remain a substantial customer for NRI’s services.” Similar confidence in strong ODA support for NRI was expressed by Tony Baldry, then Parliamentary Under Secretary of State for Foreign and Commonwealth Affairs in a letter to the trade unions of 21 February 1995. The Minister wrote “. . . there is every reason why the close working relationship between NRI and ODA headquarters should continue, and none at all why a change of ownership should disrupt it.”

The privatisation negotiations led to the University of Greenwich becoming owners of the NRI on 1 May 1996 but a separate company, Natural Resources International (later re-named NRInternational), owned by the above Universities in a consortium was also set up, with ex-NRI employees making up the bulk of its staff. NRInternational bid successfully for the management of DFID RNRRS research programmes such as the crop protection programme, crop post-harvest programme and the post-harvest Fisheries programme.

#### CONSEQUENCES OF PRIVATISATION AND GOVERNMENT POLICIES ON NRI STAFFING LEVELS

In April 1983, the authorised staff complement of the scientific and special units was 806, with 308 posts in DOS, 96 in LRDC, 128 in COPR and 274 in TPI. Excluding DOS, this meant that 498 staff plus the Corps of Specialists constituted what eventually became the NRI with a staff of about 550. In 1993–94, there were 50 redundancies. In April 1995, prior to the completion of the privatisation exercise, Baroness Chalker of Wallasey, then Minister for Overseas Development, told the House of Lords that “Against the background of changes in the nature and level of demand for NRI’s services, we have put in hand a programme of restructuring. The result will be a smaller institute which focuses on NRI’s interdisciplinary strengths in adaptive research and related development policies. NRI management envisage an organisation of around 360 professional and administrative staff, which will mean a reduction of present staffing levels by 140. The aim will be to achieve the reduction in staffing by voluntary means. The restructured institute will continue to play a major role in Britain’s programme of aid for the natural resources sector in developing countries. It will do so as a supplier of services in its own right and as a manager of resources from the available science base. NRI’s expertise is increasingly sought by outside clients in the development community. The Institute will be strongly encouraged to expand this aspect of its activities.” The privatisation of NRI was not the result of appropriate planning but was against the background of privatisations across the spectrum of UK science that has seen the numbers of personnel engaged in research and development in Government Departments fall by 34.9%.

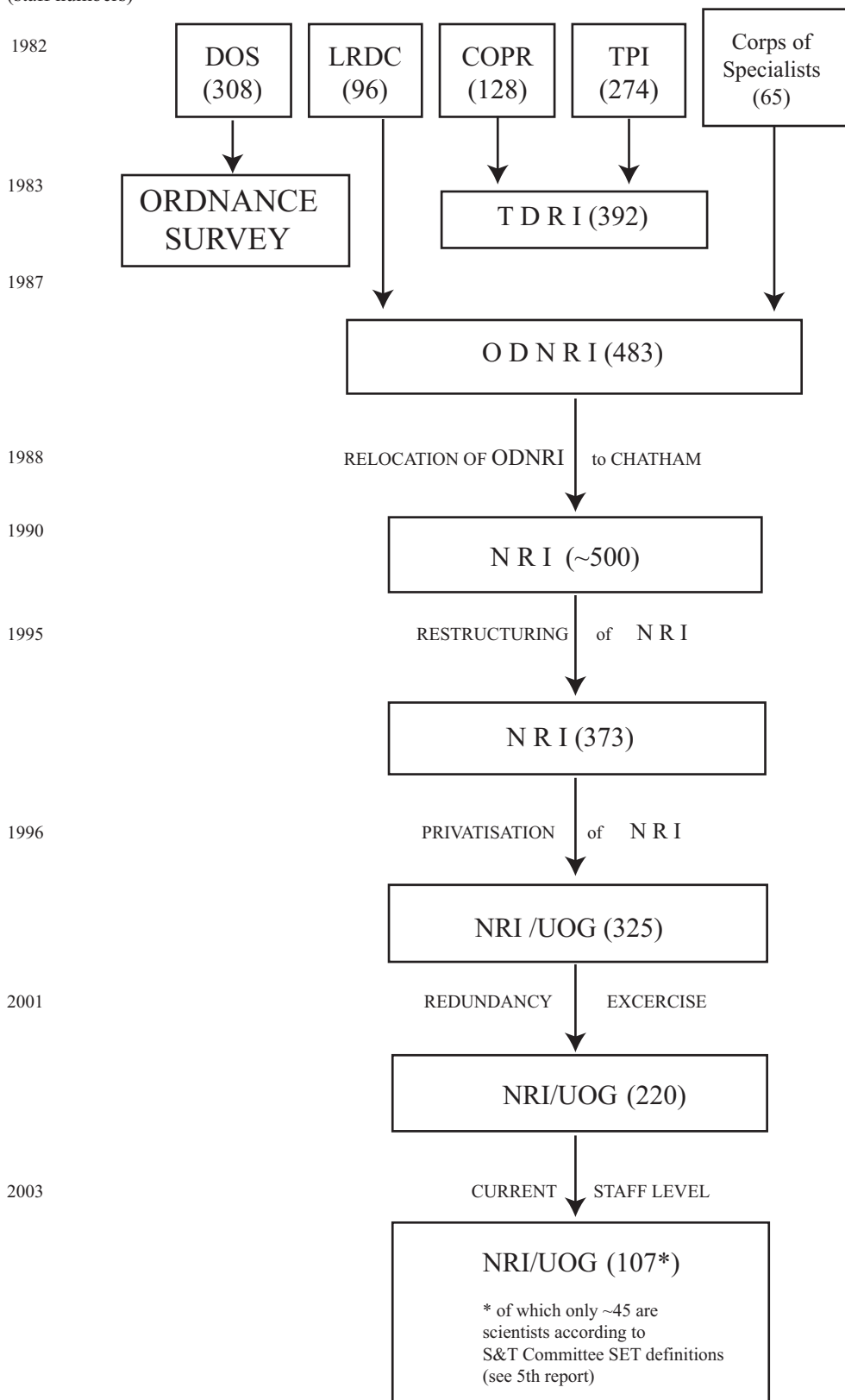
The restructuring was a consequence of projected cuts in ODA funding to NRI from £19.9 million in 1994–95 to £11.1 million in 2000–01 (a decrease of 44%). However the cuts in funding from the Research Strategy were proportionally more severe (£10 million to £4.8 million). The Advisory and Support Commission (ASC) budget for advice to DFID fell from £3.3 million to £1.6 million and income from the Geographical Division (which provided funds for bilateral aid work) was projected to drop from £6.5 million to £4.6 million. In the event, the funds for bilateral aid did not materialise. The ASC has been abolished and replaced by a PASS fund, but this is largely limited to use for socio-economic advice.

In July 2001, the University of Greenwich announced that about 130 jobs at NRI were to be lost. Since then there has been more attrition, with staff unable to secure commissioning from grants being picked off by management on a piece-meal basis. Currently (November 2003) there are 107 staff at NRI, less than 14% of the staff complement of the ODA scientific and special units in 1983.

DIAGRAM SHOWING HISTORY OF ODA SCIENTIFIC AND SPECIALIST UNITS SINCE 1982.

(staff numbers)

Diagram showing history of ODA scientific and specialist units since 1982. (staff numbers)



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## APPENDIX 65

### Memorandum from Dr Peter Hartman, Director General, International Institute of Tropical Agriculture

Thank you for the opportunity to provide our views to the forthcoming inquiry of the UK Parliamentary Science and Technology Committee. In my role as head of the International Institute for Tropical Agriculture (IITA) one of the CGIAR centres based in Nigeria, I have been trying to highlight key emergencies that Africa faces. Here I mention three and the role that investments in agriculture are playing or can play.

#### CASSAVA BROWN STREAK VIRUS

The devastation posed by the Cassava Brown Streak Virus which is affecting over seven countries goes beyond food sources and to issues of political stability. If we do not tackle it some countries like Mozambique will face dire consequences. The magnitude of the threat is such that the Government of Mozambique sent a high level delegation, led by its Vice Minister for Agriculture, to IITA to impress us on its implications and potential political repercussions. United Kingdom via DFID's earlier support on the study of this virus now allows us to move at a faster rate than had we been starting at zero. We do not know much about this virus and much research is still needed, but DFID's earlier contributions gives us a head start.

#### WAR TO STABILITY IN SIERRA LEONE

The United Kingdom's commitment to support Sierra Leone is timely and well placed in moving a war ravaged country back to normality. We learned that United Kingdom's support would focus on democratisation and decentralisation. However, if the government of Sierra Leon does not successfully address the food problem democratisation and decentralisation might be that much harder to achieve. We come by this conclusion after doing field surveys and designing a food strategy for the country at the request of the President of Sierra Leon who told us that he promised two things, peace and food security and that he has delivered on the peace but needs help with the food security promise. DFID's support to agriculture will certainly grease the skids of the United Kingdom's goal of improved democratisation and decentralisation as such objectives invariably are easier to achieve when a population is running on a full stomach.

#### NIGERIA AND REGIONAL STABILITY

In Nigeria today, President Obasanjo is facing an emergency posed by the combination of two virulent forms of a virus that is destroying cassava, a vital food crop and an important economic contributor. Cassava is grown and used in some of the most densely populated parts of Nigeria and its products are consumed by the huge urban populous. The President has launched an Emergency Program to tackle this menace and IITA has been asked to lead it. Key private sector companies have joined. It is earlier investments in agricultural research supported by donors like United Kingdom and others that now gives IITA the products with which to deal with this virus. If we fail to deal with it the next 18 to 20 months, to quote the President's Advisor, "there would be no democracy and no polity."

What we see is a clear pattern of support to agriculture paying big dividends to the poor in Africa, not only in protecting their food source, but also with preventing major political upheavals. As several of the Presidential Advisors in Nigeria, Mozambique, Sierra Leone and others have said, it is difficult to talk about democracy and decentralisation, all nice things when the agricultural sector on which 60 to 80% of the populous depend is not in a healthy state. Hungry people tend to be angry people. In the case of sub-Saharan Africa (SSA), it is of course impossible to see or argue for any other developmental engine that does not embrace the rural sector and agriculture with it. The multipliers via agriculture for reducing hunger, reducing poverty and correcting severe gender bias are simply too high to ignore. Even in Nigeria with its tremendous oil wealth, the Government has come to admire the performance of agriculture. The President of Nigeria now personally leads quarterly meetings on agriculture.

One of our biggest challenges in SSA is poverty. Our people and our governments are poor. In recognition of agriculture's importance, NEPAD (New Partnership for African Development), for example, encourages governments to allocate a minimum of 10% of their budget to agriculture. Some governments already do more. Nevertheless, the overall wealth of many governments in SSA is such that even if doubled such allocations will not be enough. To put this in perspective, the total annual income of the most populous country in Africa (Nigeria), is less than that of the fire department of New York City, and it is half of Singapore's budget for its land transport system.<sup>106</sup> I state these figures to underscore that we are up against incredible odds.

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<sup>106</sup> Chief A Ogbe, National Chairman of Nigeria's Ruling Party, Talk given at IITA, November 2002.

## POVERTY AND AGRICULTURE

The relation between poverty and agriculture is extremely important. It is difficult to deal with poverty without dealing with agriculture, in particular agricultural productivity and the rural sector as a whole. Even for the urban poor the success of agriculture is vital to them. This relation between poverty and agriculture is, in very large part, rather straightforward.<sup>107</sup>

We can improve both rural and urban poverty, through agricultural productivity. Productivity improvements lead to increases in food production, which leads to cheaper food. The availability of cheap food is of enormous benefits for the poor.<sup>108</sup> This benefit is the result of the reduction of their food bill, which makes up a very high percentage of their total expenditure. *A 10% reduction in food prices could contribute almost half that or more in increases to the real income of the poor.*

The benefits do not stop there as more food is produced and moves from the farms to the urban areas, economic activities, small and big, are generated all along the way in production, collection, grading, storing, transporting, consolidation, processing and resale. These activities create employment and income opportunities for both the rural and urban poor. This economic generation in the rural localities is an important ingredient to United Kingdom's aim to increase decentralisation, eg, in Sierra Leone.

In addition to the economic benefits, the availability of cheap food, and thus greater consumption of food, contributes directly to improved nutrition, which contributes to better health. It might be difficult for those of us working out and dieting to understand, but at this level of income the formula is simple, ie, *more food is good*. These positive outcomes themselves add to economic gains through fewer sick days, higher productivity, and less medical and funeral expenses. In a sentence, *one cannot overstate the power of agriculture productivity as a tool for poverty reduction.*

The Senior Advisor to President Obasanjo of Nigeria put it this way.

“No sector will employ as many people as agriculture.

No sector will contribute as much to the gross domestic product and no sector will bring as much stability”<sup>109</sup>

## APPROACHES TO POVERTY REDUCTION

So that the poor can benefit more directly from the full force of science, we need approaches that could reduce the need for expensive inputs and costly support programs. Biocontrol, agronomic strategies to improve soils; control weeds and pests, and more efficient processing systems come to mind. Such approaches are knowledge intensive and require a lot of research to substitute for inputs and government programmes. The bio-control program for cassava mealybug released by IITA; for example, avoid the need for costly inputs. It even worked in countries that were at war. Combined with breeding and other national programs, it enabled production of cassava to increase threefold in 10 years. Such approaches require a lot of research and some long-term commitments and we are trying to raise the awareness for stable financial instruments that could support such work.

November 2003

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## APPENDIX 66

### Memorandum from ODI (Overseas Development Institute)

#### *Bridging Research, Policy and Practice: Introduction*

It is clear that better utilisation of science in development policy and practice can help save lives, reduce poverty and improve the quality of life. The problem is there are often disconnects between science, policy and practice in international development. Scientists may be working on issues that are not relevant to people in developing countries. Policymakers may not be aware of—or, sometimes, interested in—recent scientific developments. Practitioners may see research as a waste of time and money given other “pressing” problems.

The Research and Policy in Development (RAPID) Programme at the Overseas Development Institute (ODI) has been working on the links between research and policy for several years. Our aim has been to generate a more systematic understanding of how research can contribute to pro-poor policies, and systems to put it into practice. This submission is based on the work of the RAPID Programme over the last few years (see Annex 1). It also specifically draws on our preliminary work for the independent evaluation of the Engineering Knowledge and Research programme of the Infrastructure and Urban Development Department (IUDD) at the Department for International Development (DFID).

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<sup>107</sup> We can always “complicate” such links but the value of “complicating” in development is sometimes questionable.

<sup>108</sup> Many farmers—30 to 60%—are also net food buyers. See Michigan State University studies on SSA.

<sup>109</sup> Chief A Ogbe.



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 GENERAL COMMENT ON SCIENCE, POLICY AND PRACTICE

Often, the link between science, policy and practice is still viewed as a linear process, whereby a set of findings is shifted from the “research and development sphere” over to the “policy sphere”, and then has to the “practice sphere”. All our work suggests a more dynamic and complex view that emphasises a two-way process between research and policy, shaped by multiple relations and reservoirs of knowledge. The traditional question “How can science be transported from research to policy and practice?” must be replaced by a more complex question: “Why are some of the new ideas and products picked up and acted on, while others are ignored and disappear?”

ODI presents a conceptual framework that helps answer this question. The conceptual framework identifies three overlapping spheres of policy influence: “political context” (political structures and processes, institutional pressures, prevailing concepts, policy streams and windows etc) interact with the issues around “evidence” (credibility, methods, relevance, packaging and communication etc) and “links” (connections between stakeholders, relationships, networks, the media etc).

All our work indicates that “political context” is the most crucial sphere of influence. Actors can take various steps to maximise their chances of shifting development processes—and even the “political context” itself. Whilst “evidence” is the conceptual sphere best understood—the key is to provide the solution to a problem. Other issues are the need to ensure topical relevance, operational relevance and credibility. While we know that links or intermediaries are important, our knowledge of exactly when and how “links” work is currently poor, and this will be the focus of further research through ODI’s RAPID programme. For more information see: [www.odi.org.uk/rapid/](http://www.odi.org.uk/rapid/)

## SPECIFIC POINTS

Our comments relate particularly to the work of the Department for International Development (DFID). Many of the general issues regarding DFID research policy and the use of science have been documented in the Surr *et al* report of 2002. Many of the recommendations have also been taken up as part of the re-organization of the DFID policy division.

We focus our submission on two of the specific points identified by the committee:

*The extent to which investment in research and the promotion of innovation play a part in DFID’s country level development programmes.*

In general, there is relatively little emphasis given to the investment in science and promotion of innovation at the country level. Among other things, country offices conduct poverty assessments, identify problems and some causes. There is the perception that DFID London has not adequately made the case regarding the linkages between science, technology and engineering and poverty reduction. So too, implementers of DFID supported work in this area have not adequately linked to country offices. Therefore, it has been commented that country staff don’t often think about research and that poverty assessments focus on economic and social issues and not science or engineering questions.

Our work for DFID indicates that there is real need to integrate research, science and promotion of innovation in country programmes. In the past, staff in country offices were usually sent copies of proposals which are relevant to their country. However, this was not particularly effective. As DFID is moving to prioritise capacity building within countries and demand-led research, it is clear that country offices will have a vital role in identifying the demand and gaps in capacity. Our work also emphasises the need to consider much more carefully the context for research, innovation and policy change.

*The progress of UK efforts to build scientific, technological and engineering capacity in developing countries to help them to overcome trade restrictions, and the co-ordination of these efforts with NGOs, charities and international programmes.*

The critical problem to date has been that much DFID-supported work in this area has been UK-based, supply-driven and technology focused. There have been some good projects, but there is little empirical evidence of impact on policy or practice for much of the research. The challenge is to shift towards a more balanced, better integrated, poverty-needs driven approach.

Our work suggests that far too little emphasis was given (in effort to support scientific, technological and engineering capacity in developing countries) to local context, priorities or demand. Often technology projects did not justify how the problem relates to poverty or to Country strategies or to DFID’s own priorities. Rarely were processes undertaken to assess perceived demand or mechanisms established for linking a project to probable users and beneficiaries. Emphasis tended to be placed on developing technology rather than improving access to knowledge or adoption of knowledge in the South. All too rarely were there attempts, at the start, to understand the broader environment and “knowledge systems” in which the project takes place (yet these are the most crucial factors affecting success).

Furthermore, our analysis suggests that dissemination efforts of work on science, technology and engineering have been UK focused (through publishers in the UK). There has often been relatively little effort to make the knowledge available for use by government; the private sector or civil society groups in developing countries. Similarly, little effort has gone towards: reaching smaller and poorer users; improving policies more generally or engaging information networks.

January 2004

## Annex 1

### BRIDGING RESEARCH, POLICY AND PRACTICE

Sometimes it seems that researchers and policy makers live in parallel universes. Researchers cannot understand why there is resistance to policy change despite clear and convincing evidence. Policy makers bemoan the inability of many researchers to make their findings accessible and digestible in time for policy decisions. Yet better utilisation of research and evidence in development policy and practice can clearly help save lives, reduce poverty and improve the quality of life. Although evidence clearly matters, there is no systematic understanding of when, how and why evidence informs policy.

ODI is working towards a better understanding of how research can contribute to pro-poor policies, and systems to put it into practice for several years. A literature review published in 1999 identified theoretical approaches in political science, sociology, anthropology, international relations and management, and provided a 21-point checklist of what makes policies happen. In 2002, ODI developed a new Framework for understanding research-policy links. It tested and used it to analyse four policy events: the adoption of PRSPs by the World Bank in 1999; the development and adoption of an ethical charter by humanitarian agencies since 1997; animal health policies in Kenya since 1985 and the incorporation of the Sustainable Livelihoods Approach within the DFID White Paper in 1997. ODI also coordinated the collection and analysis of 50 short case studies based on existing knowledge about research-policy links for the Global Development Network “Bridging Research and Policy Project”, and has undertaken a wide range of advisory and consultancy work on these topics.

Traditionally, the link between research and policy has been viewed as a linear process, whereby a set of research findings is shifted from the “research sphere” over to the “policy sphere”, and then has some impact on policy-makers’ decisions. Opinion is now shifting away from this model towards a more dynamic and complex view that emphasises a two-way process between research and policy, shaped by multiple relations and reservoirs of knowledge.

The traditional question “How can research be transported from the research to the policy sphere?” has been replaced by a more complex question: “Why are some of the ideas that circulate in the research/policy networks picked up and acted on, while others are ignored and disappear?”

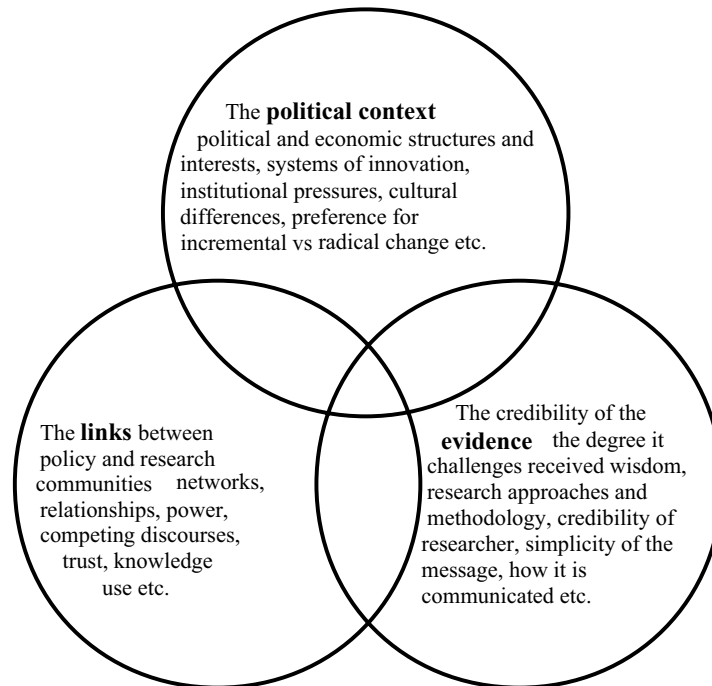
The answer seems to lie in a combination of several determining influences, which can broadly be divided into three overlapping areas: the political context; the credibility of the evidence; and the links between policy and research communities.

Emerging results from ODI’s work so far confirm this, indicating that research is more likely to contribute to evidence-based policy if:

- it fits within the political and institutional limits and pressures of policy makers, and resonates with their ideological assumptions, or sufficient pressure is exerted to challenge those limits;
- the evidence is credible and convincing, provides practical solutions to current policy problems, and is packaged to attract policy-makers interest; and
- researchers and policy makers share common networks, trust each other, honestly and openly represent the interests of all stakeholders and communicate effectively.

But these three conditions are rarely met in practice, and although researchers can control the credibility of their evidence and ensure they interact with and communicate well with policy makers, they often have limited capacity to influence the political context within which they work, especially in less democratic countries. Resources are also limited, and researchers need to make choices about what they do. Evidence from ODI’s work so far provides preliminary recommendations in three areas. First, there are some things researchers need to know about the political context, issue area (evidence) and key actors and networks (links). Second, there are some things researchers need to do in each of these areas. Third, some clear evidence is emerging about the most effective way to go about things.

There is much more to be done. Over the next two years the RAPID Programme will work with policy-makers, researchers and practitioners to undertake further research, and to develop practical guidelines on how to improve the uptake of research in different development policy contexts. For more information see: [www.odi.org.uk/rapid/](http://www.odi.org.uk/rapid/)




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#### APPENDIX 67

##### Memorandum from the Medicines for Malaria Venture

The morbidity and mortality of malaria have overwhelming social and economic impact on the developing countries. This disease is the number one killer of young children in Africa, claiming one life every 30 seconds. Malaria is a curable disease—over 90% of the deaths are preventable with effective antimalarial drugs. Unfortunately, it is also a disease that is widely neglected with prevention and treatment grossly under funded.

MMV is at the forefront in antimalarial research with the largest portfolio of drug R&D in history. Currently drugs, with treatment time as short as three days, are the only way to treat malaria. Unfortunately, the antimalarials that are available now are either widely ineffective due to drug resistance or too expensive to reach the hundreds of millions of people that need it. MMV's aim is to develop at least one effective and affordable drug every five years with the first drug registered by 2010.

We have deep knowledge of the disease and expertise in antimalarial drug research and development. We would be honored to have the opportunity to give oral evidence to the committee.

*November 2003*

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#### APPENDIX 68

##### Memorandum from Robert P Mahoney and Robin S Waters

We take it for granted that we can accurately and unambiguously describe our neighbourhood, our towns and our country. We can use this to define who owns what and where our boundaries lie. It is almost impossible to imagine life without being able to do this. It underpins all aspects of the functioning of a modern economy and society. We do this using maps that are accurate and that are kept up to date.

Yet, it is not something that can be taken for granted across the world. While huge amounts of aid are lavished on major development projects, the RICS Geomatics Faculty and the RICS Foundation were concerned that little attention was being given to the mapping needs of developing countries. The research

paper entitled “Getting it together—the geography jigsaw” was commissioned by RICS to look at: “improving our understanding of the processes and procedures available for the support of mapping infrastructure in developing and transitional economies”. This paper sets out to illustrate some of the areas covered by the research.

#### SUSTAINABLE GEOMATICS?

This research was prompted by requests from RICS members in many parts of the world for help with understanding the current environment in which “mapping” needs to be provided. This is very different from the situation of 20 years ago when large bilateral aid packages were churning out maps for the developing world albeit often prompted in both East and West by “cold war” considerations.

Today we have dramatic improvements in the quantity of raw data available from aerial and satellite remote sensing as well as much more sophisticated methods for handling this raw data and interpreting it for a wide variety of end users. But if you ask for an up to date map of a Caribbean island or of an African city you may get a tourist map (if it is a tourist area) and, if you know where to go, you may get an aerial photo mosaic or a satellite image. But ask for a map with settlement names, road numbers and a consistent interpretation of ground features for administration purposes and you will most likely get, at best, a 20 year old map with no updates and with a grid that is incompatible with modern GPS equipment.

There are many people and organisations that will buy the aerial and satellite imagery, analyse it for their own specific purposes and throw it away. This applies to exploration companies, aid agencies and the military. Around them will be a local civil administration that cannot afford the imagery, has no facility to interpret it but would probably love to have a hard copy of what the others have put in the bin.

Was all that money spent on mapping in the post war years completely wasted? Or was it necessary at the time—before satellites—and is no longer required by anyone? Or are we now wasting a lot of money on duplicating the general interpretation of imagery in specialist organisations instead of having a general purpose map (or SDI) available for everyone at a reasonable cost? Expressed in those terms this research may be considered relevant to the developed world as well. We are constantly arguing about who should pay and about the role of the private sector.? It could be argued, for example, that the developed world (or that part which has well maintained mapping) has merely delayed the advent of the same problem. Right now we see that the agricultural programmes are beginning to move towards high resolution imagery as well as (or instead of?) large scale maps or vector data.

The researchers looked at the different parties involved with the production and use of “mapping infrastructure”—national mapping agencies, funding agencies, contractors and consultants. The main conclusions reached will come as no surprise to this audience:

- The need to increase awareness of the cross-disciplinary benefits of mapping/SDI to governments and funding agencies;
- The need effectively to present mapping/SDI benefits to other disciplines;
- The need to identify gaps in support offerings—particularly with regard to the specification of useful cross disciplinary programmes and products;
- The demand for “coaching” (not just training) of local professionals and departments in cost effective methodologies and procurement processes; and
- The need to spread best practice—particularly from similar scenarios.

Recently one of the authors has been working in the Caribbean where an island requires a revaluation of all of its land and property for taxation purposes. At present the Valuation List has developed property (buildings) shown as labelled symbols on 20 year old large scale paper maps. Properties constructed since the 1980’s have been approximately located on the map by valuers unskilled in land surveying and not equipped with GPS or aerial photos. The net result is that we have found 15% to 20% of properties missing, and a significant proportion of the rest tens of metres out of position. Some of the missing buildings are worth hundreds of thousands of dollars and many of the wrongly located buildings are small and very close together. It is therefore evident that the lack of up to date mapping or imagery available to the Valuation Department is a severe handicap, is devastating for staff morale and is preventing the government from fairly collecting a basic tax.

We also noted that all of the utilities and government departments are in the same position. Only the telecommunications company (privately owned and arguably on the basis of monopoly profits) had implemented a GIS—using scanned versions of the 20 year old maps but with new buildings entered and with pop up photos when a subscriber number is entered. The Lands & Surveys Department is under-staffed and under-resourced, it just keeps up with its primary function of conducting and checking land surveys for conveyancing. It has not been able to revise the basic 1:2,500 topographic maps since they were made. The Planning Department has had a set of 1:10,000 photography for the last three years which were unknown or unavailable to any other departments. There are no street addresses on the island and there is no Land Register.

However it is believed that there is money available from at least one multilateral agency to fund mapping and SDI. But there appears to be a lack of political will to do anything about the situation. Unless this high level backing is forthcoming the result will be piecemeal development of unstructured and incompatible datasets with either hidden inefficiencies in many organisations or considerable waste of resources with duplication of effort.

The need is for mapping and GI professionals to be able to understand their customers needs and to deliver solutions which are cost effective and make sensible use of new technologies where relevant is paramount. And current imagery and field data collection tools are making it much easier to demonstrate the benefits of new technology in ways which have been difficult with the previous generation of digital mapping systems and expensive GPS equipment.

We presented the preliminary results of this research to a multi-disciplinary audience at the Global Alliance for Building Sustainability in Johannesburg last year. That audience of planners, architects, engineers and other property professionals were able immediately to see some of the benefits of a co-ordinated SDI policy. The final Johannesburg conference resolutions contain many fine words, including some directly alluding to mapping infrastructure. They need to be followed up with well directed actions to which we can all contribute.

January 2004

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## APPENDIX 69

### Memorandum from the Institute of Food Science & Technology

Aware of the plight of the 200 million of our undernourished fellow human beings in developing countries who daily suffer hunger, malnutrition and death (24,000 deaths a day from malnutrition-related causes) the Institute of Food Science and Technology (IFST) welcomes this Inquiry. As the UK professional body of food scientists and technologists we are especially concerned that Government policy and Government Departments and Agencies should facilitate and fund the application of UK food science and technology knowledge, expertise and new research to contribute towards helping developing and transitional countries. We are well aware that the problem is multi-factorial and will not be solved by science alone, but it will not be solved without the fullest possible application of science.

Crop failure and poor food security are significant sources of political instability and are one of the major sources of the North South divide. EU funding in this area is very limited and DFID is winding down its support of crop science for developing countries. It would be in the national interest therefore for BBSRC to support crop science in the international rather than the national context. A particular focus should be Africa where the food security problem is most acute and where sustainable increases in yield would have a very large impact. Africa is also urbanising rapidly this has led to an increasing demand for packaged and processed food, improved crop yield and quality would greatly facilitate this nascent food industry and lead to an increase in overall economic activity.

IFST is an NGO, and its public efforts in this area are conducted via the IFST Trust fund, a registered charity. The International Union of Food Science and Technology (IUFOST), a sort of United Nations of food science and technology with country members each represented by its national food science society/institute, is developing with FAO a joint IUFOST/FAO on-line searchable database into which, starting later this year, researchers carrying out projects relevant to developing countries will be solicited to input data about their projects. IFST will be taking the lead in soliciting the inputs from UK researchers. In this connection we have been in correspondence with DFID and sought some help in funding the cost of this exercise. We received the following response (8 January 2003):

“As you probably know DFID has a very clear focus on poverty reduction and our resources are increasingly directed through national governments and our country programmes as well as through multilateral channels. In the area of Food Security and Hunger we work closely with FAO, WEP and WAD amongst others. We also fund global public goods research through our renewable natural resources research programme, which is managed by leading academic institutes in the UK (further details on the DFID website).

Unfortunately, we would not be able to fund the type of work outlined in your proposal. We would however be willing to provide information on DFID activities in this area that could form part of a UK contribution, and I am happy to work with you to provide details in a relevant format.”

We are also aware of and commend DFID’s Natural Resources and Information Systems on-line searchable database (NARSIS) “to provide intelligent knowledge on DFID funded Natural Resources, Environment and Livelihoods projects”. <http://www.ids.ac.uk/narsis/>

In the area of Food Irradiation both MAFF/DEFRA and DARD have sponsored work on the feasibility, application and detection of food irradiation. On the international scene this has been taken forward by the IAEA and staff from Northern Ireland have been involved in IAEA-sponsored work with both developed and underdeveloped countries. Staff have also been seconded to IAEA and have been involved in technology transfer in this area

After the Chernobyl incident a great deal of work was done across the UK pertinent to food safety. This was sponsored by the four Agriculture Departments with MAFF having a very important funding role. This expertise was taken forward mainly through EU-funded projects with the work focussing on the affected States of the former USSR. For example, work on agricultural countermeasures funded by MAFF and DARD was taken forward through an IAEA project.

Work which is largely technology transfer has been done in the area of Food Safety through projects for the establishment of Food Control Laboratories in the former USSR. This was sponsored by Northern Ireland Public Enterprises (NICO) and funded by the EU; DTI were also involved. The Food Control Laboratories were in Russia (Puschino, south of Moscow, and St Petersburg) and in Azerbaijan and the work involved the design and equipping of the laboratories, staff training and laboratory accreditation. We are also aware of the recruitment of individual UK experts who have spent time in Poland and the Baltic countries advising and helping to establish food enforcement systems.

Finally, we draw attention to the need to strengthen the role played by UK Research Institutes and Universities in training students, and particularly post-graduate students, from developing countries, in food sciences, plant pathology, and agricultural and horticultural sciences.

January 2004

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## APPENDIX 70

### Memorandum from the Nuffield Council on Bioethics

The Nuffield Council has recently considered the potential contribution of genetically modified (GM) crops to agriculture in developing countries. I have pleasure in enclosing copies of the Council's publications on the topic: *Genetically modified crops: the ethical and social issues* (published in 1999) and a new Discussion Paper, *The use of genetically modified crops in developing countries*, published in January 2004.

We are aware that achieving food security and reducing poverty in developing countries are highly complex issues. We do not claim that GM crops will eliminate the need for economic, political or social change, or that they will feed the world. However, we do believe that GM technology could make a useful contribution, in appropriate circumstances, to improving agriculture and the livelihood of poor farmers in developing countries. We should like to draw your attention to recommendations that specifically relate to UK international development policy:

- In particular cases, GM crops can contribute to substantial progress in improving agriculture, in parallel to the (usually slow) changes at the socio-political level. GM crops have demonstrated the potential to reduce environmental degradation and to address specific health, ecological and agricultural problems which have proved less responsive to the standard tools of plant breeding and organic or conventional agricultural practices. *There is an ethical obligation to explore these potential benefits responsibly, in order to contribute to the reduction of poverty, and to improve food security and profitable agriculture in developing countries* (paragraph 4.48).
- Much of the current privately funded research on GM crops serves the interest of large-scale farmers in developed countries. Consequently there is a serious risk that the needs of small-scale farmers in developing countries will be neglected. It appears that research on these crops will have to be supported primarily by the public sector. *We therefore affirm the recommendation made in our 1999 Report that genuinely additional resources be committed by the UK Department for International Development (DFID), the European Commission, national governments and others, to fund a major expansion of public GM-related research into tropical and sub-tropical staple foods, suitable for the needs of small-scale farmers in developing countries. In determining which traits and crops should be developed, funding bodies should be proactive in consulting with national and regional bodies in developing countries to identify relevant priorities* (paragraphs 6.16–6.17).
- It is of particular importance that developing countries improve their capacity to independently review and assess the use of GM crops in specific situations. *Since means for the development of the required expertise are limited in most developing countries, we welcome and endorse the United Nations Environment Programme and the Global Environment Facility (UNEP/GEF) undertaking of promoting the building of capacity in relevant expertise* (paragraph 5.24–5.25). We are aware that DFID currently supports this initiative and also seeks to devise guidelines for participation by the public in decision making processes for biosafety frameworks.
- The freedom of choice of farmers in developing countries is being severely challenged by the agricultural policy of the European Union. Developing countries might well be reluctant to approve GM crop varieties because of fears of jeopardising their current and future export markets. They may also not be able to provide the necessary infrastructure to enable compliance with EU requirements for traceability and labelling. *We recommend that the European Commission (EC), the UK Department for International Development (DFID) and appropriate non governmental organisations which monitor the agricultural policies of developing countries examine*

*the consequences of EU regulatory policies for the use of GM crops in developing countries. We recommend that the European Commission establish a procedure to report on the impact of its regulations accordingly (paragraph 5.50).*

- Access to plant genetic resources is critically important for the development of GM crops which are suited to the needs of developing countries. *We welcome the decision by the UK Government to ratify the International Treaty on Plant Genetic Resources for Food and Agriculture. Access to resources falling under the Treaty is of crucial importance in the development of crops suited to developing countries. We recommend that in the negotiations regarding the standard Material Transfer Agreement (MTA), the UK Government aims for provisions that exempt users in developing countries from payments, where commercial applications arise from material covered by the MTA. Where exemptions are not appropriate, differentiation of payments should take into account the level of development of the country in question (paragraph 5.15).*

January 2004

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## APPENDIX 71

### Memorandum from Professor John Ball and Professor Geoffrey Oldham, University of Oxford

We have recently been in Pakistan at the invitation of the Minister for Science & Technology and of Higher Education, Professor Atta-ur-Rahman. As part of an impressive effort to revitalize and strengthen higher education in Pakistan, 800 students will be sent abroad over the next two years to study for PhD's. The countries that have been selected to host the bulk of these students are France, Germany, Austria and China. Although a very small number who are selected at the most prestigious universities such as Oxford, Cambridge and Harvard will be supported, with this exception a decision has been made to exclude the UK from the list of recipient countries, on the grounds of the high level of fees. Indeed, Professor Atta-ur-Rahman pointed out that Pakistan could support four students in the selected countries for the cost of one in the UK. It is hard to imagine a clearer example of the negative impact of the current UK policy on student fees.

We hope that the Select Committee will consider what action is necessary to enable more students from the developing world to be trained at UK universities. The educational, personal, commercial, cultural and diplomatic benefits of receiving overseas students are well known, and the sustained contribution to development that support for such students can bring about should not be ignored.

January 2004

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## APPENDIX 72

### Supplementary memorandum from the Department for International Development

1. *What recent changes have been introduced to encourage and enable scientists in different disciplines within DFID to collaborate? What practical difference has the establishment of the policy division made to improving cross-disciplinarity?*

DFID created a Policy Division in April 2003, that established 22 new multi-disciplinary teams on key development policy issues, such as Economic growth, HIV/AIDS, Agriculture, Education for All, and Aid Effectiveness. A full list is included in the enclosed Directory. Teams are made up of an appropriate mixture of social and natural scientists with thematic and geographic expertise, and this has considerably increased collaboration across disciplines.

The Central Research Department (CRD) was established as part of the Policy Division Reorganisation, and for the first time brought together into one centralised department all the research programmes from the former individual Departments in Education, Health, Rural Livelihoods etc. The Central Research Dept is currently finalising a new research strategy, which includes new working structures to promote multi-disciplinary research to solving problems. Cross team working, such as collaboration between agriculture and health, is an important element of the new structure. CRD has also worked jointly with a number of Policy Division Teams eg on Global and Local Environment and Renewable Natural Resources and Agriculture, and maintains a close relationship with DFID's Chief Advisers and Heads of Profession.

2. *What are the definitions that DFID uses for “research” and “policy advice”? What, in practical terms, is the difference in the way that work is commissioned, managed and used under these two headings. What impact has the establishment of the policy division had on expenditure under these headings?*

There is no standard Whitehall definition of research and policy advice, so Departments can define these concepts differently.

*Research* is an investigation undertaken to discover new facts, or get additional information over a longer-term period. The key characteristics for DFID are (i) it generates information that is publicly available, and aimed at whoever can most relevantly use it in the task of reducing poverty, (ii) it is long-term in nature (generally three years or more).

In practical terms, research funding is handled by the Central Research Department. Some is done through contributions to international research initiatives, such as the Consultative Group on International Agricultural Research, or the International AIDS Vaccine Initiative. The rest is commissioned directly, generally by competitive tender. In all cases, DFID seeks to ensure that the research outputs are communicated to potential users, both by requiring programme managers to have dissemination strategies, and by supporting channels such as the id21 website ([www.id21.org](http://www.id21.org)).

*Policy advice* is the giving of informed opinion about what to do, based on policy analysis. For DFID, the key characteristics that distinguish policy analysis from research are (i) DFID is the client that benefits from the analysis, and (ii) it is shorter term (in the region of three months). Policy analysis generally is based on existing research, rather than generating new knowledge.

In practical terms, the Policy Teams in Policy Division undertake policy analysis in order to formulate policy to address shorter term, pressing development issues. The staff in the teams undertake analysis themselves, and also commission consultants. The subsequent analysis then provides Ministers and Senior officials with advice on how issues could best be managed.

It is too early to tell what the impact of expenditure under these two headings has been, as Policy Division only became operational in April 2003, and data for 2003–04 Financial Year has yet to be compiled. However, we can say that research funding for science is rising, particularly for agricultural research.

3. *What were the number and proportion of advisers in DFID country offices recruited locally (a) five years ago and (b) at the latest date for which figures are available?*

(a) Unfortunately, data from five years ago is not available.

(b) In February 2004, 62 of 644 Advisory staff (9.6%) were recruited locally.

Of this figure 397 Advisers are based overseas, and the 62 locally recruited are 15.6%.

4. *Are there any horizon scanning or other planning activities which look beyond 2015?*

Yes. (i) Some DFID research currently includes an element of horizon scanning. For example, research on chronic poverty, citizenship, conflict and exclusion uses scenario planning to see beyond immediate approaches and time horizons, using a 2003–30 timeframe. (ii) DFID participates in international exercises, such as the forthcoming Assessment of Agricultural Science and Technology for Development, through the World Bank, which will consider how short, medium and long-term perspectives interlink up to 2050. (iii) DFID is also considering a horizon scanning exercise of its own as part of its new research strategy.

5. *In what areas were there found to be shortages in the numbers of in-house staff? How many more are being recruited in different areas and what particular skills are being sought? What other sources of outside advice in addition to the WHO are routinely used for both project specific and strategic advice?*

DFID's 2004 Staffing Strategy paper identifies 141 posts that need to be filled in the organisation at the current time. This represents less than 5% of DFID's staff complement.

The professional posts are in Economics (13), Education (3), Enterprise (3), Governance (13), Health (2), Research management (6), Rural Livelihoods/Infrastructure and Urban Development (7), Social Development (6) and Statistics (1).

The numbers currently employed by each group are Economics (98), Education (46), Enterprise (23), Governance (90), Health (68), Research management (7), Rural Livelihoods/Infrastructure and Urban Development (92), Social Development (72) and Statistics (19). DFID is actively recruiting staff to cover all the identified posts that need to be filled.

The sources of outside advice that are routinely used by DFID for both project specific and strategic advice depends on the sector. Examples include:

*Health:* In addition to the WHO, DFID Health scientists are in contact with the World Bank, and the international research community, ranging from the International Aids Vaccine Initiative, to Medicines for Malaria Venture, International Partnership for Microbicides, and the International Centre for Diarrhoeal Disease Research, Bangladesh.



*Agriculture and Natural Resources:* DFID Advisers have an extensive network of contacts with the global agricultural research community. The main international network is the Consultative Group on International Agricultural Research, a strategic alliance of over 60 developed and developing countries, international and regional organisations and private foundations. It supports 16 international agricultural research centers and their work with national agricultural research systems, the private sector and civil society. DFID also works with initiatives, such as the Global Forum on Agricultural Research to secure better engagement with developing country partners. In Europe, DFID works with the European Initiative for Agricultural Research for Development, aimed at improving the relevance and effectiveness of European investments in agricultural research. In the UK, DFID is strengthening its links with the research councils, including the Biotechnology & Biological Sciences Research Council and the Natural Environment Research Council, and we maintain contacts with a wide range of institutions with expertise in tropical agricultural research.

*Infrastructure and Urban Development:* Advisers use bodies such as the Transport Research Laboratory, the British Geological Survey, and the Water and Engineering Development Centre at Loughborough University on water and sanitation issues.

*Economics:* DFID economists are in frequent contact with economists outside DFID, in other government departments, international organisations such as the World Bank, World Trade Organisation and International Labour Organisation, and in universities and research institutes throughout the world (including those in the developing countries in which we work). These contacts involve flows of information and commentary in both directions, including discussions on a wide range of policies and projects. DFID uses an Economist Resource Centre, to identify and contract consultants to undertake work for DFID departments and country offices. This consultancy work for DFID is in specialised areas—DFID’s own economists are recruited and used as “general practitioners”.

*Enterprise Development:* DFID’s Enterprise professionals, obtain advice and technical assistance on strategic issues such as market and growth analysis, financial and business development services, and investment and business enabling environment analysis from Private Consultancies.

*Education:* DFID education advisers are in contact with multilateral agencies, including UNICEF, UNESCO, EC, World Bank, and bilateral aid agencies. We also work across sectors with partners like international non-governmental organisations, the Global Campaign on Education, universities and research centres across the world and consultancy firms. Advisers also consult the UK Coalition of Higher Education Bodies and other development education partners. The Head of Profession for Education is engaged in the development of a structured programme for recruiting and retaining high quality consultants.

*Governance:* We use a Governance Resource Centre, to provide DFID and DFID’s key partners with governance advisers, and as a valuable source of structured advice on issues right across the different governance disciplines, and it is highly regarded both internally and externally.

#### 6. What steps are taken to monitor the way in which money is spent by governments in pursuit of their poverty reduction strategies?

Where possible, DFID supports governments’ own Poverty Reduction Strategies, putting funds into the government’s overall budget (“direct budget support”) rather than into separate projects. DFID adopts a comprehensive approach to assessing and managing the fiduciary risks associated with direct budget support, and this has been agreed with the UK National Audit Office. DFID’s policy is stated in the published document “Managing Fiduciary Risk when Providing Budget Support”. First, a thorough evaluation of a recipient government’s public financial management and accountability procedures, systems, practices and associated risks must be undertaken. DFID uses eight good practice principles and 15 related benchmarks, as a framework to ensure that adequate and sufficient information is obtained and a broad assessment undertaken. Secondly, there is a requirement that a recipient government must have a credible programme to improve public financial management, and to incorporate temporary safeguards to mitigate identified risks if necessary. The decision to provide direct budget support is made in cases where the potential development benefits are assessed as justifying the risks involved.

DFID works with other donors (including the International Financial Institutions), to harmonise approaches to fiduciary risk management and donor assessment procedures, in order to limit the burden placed on governments to meet requirements from different donors and lenders.

The Poverty Reduction Strategy (PRS) monitoring system forms the basis of recipient government reporting to donors, on what has been achieved from the development assistance provided by donors. The PRS process requires there to be a comprehensive and integrated national monitoring system. This is intended to cover a whole range of factors associated with implementing the strategy, to track expenditure and to demonstrate what results are being achieved by the expenditure. The PRSP Manual issued by the World Bank, gives significant guidance for establishing effective PRS monitoring systems. In many countries, information systems which would support comprehensive monitoring are weak, and so DFID is heavily involved in providing support to strengthen those national systems. The reporting of outcomes against the targets in PRSPs is an open and transparent process, and is intended to assist in strengthening government accountability to their citizens.

7. *What existing mechanisms and practices are there by which country offices link with each other, both on individual research programmes and more generally on capacity building? What changes have been and will be made to these as part of recent restructuring within DFID?*

DFID's Regional Directorates play a role in ensuring that DFID's country programmes link to DFID corporate policy and systems, and incorporate country experience. This includes identifying innovative experiences and learning lessons from across a region in order to apply good practice. Within DFID, capacity building in country (including improved access to existing knowledge) is led by country offices and regional Directorates rather than the Central Research Department.

The Asia Directorate for example, is involved in strengthening regional lesson learning and knowledge sharing across the region, and working to ensure that these opportunities are fully exploited. Advisers in the Directorate, in addition to working on regional policy/programmes, also support the work of country programmes, through direct links with country offices and the different advisory networks, and are well placed to strengthen the lesson learning and links between country offices.

In DFID's Africa Directorate, country and regional teams are encouraged to consider what related work is being undertaken already within Africa Division, by other Divisions in DFID, as well as by other donors and organizations. Existing systems like the Natural Resources Database NARSIS ([www.narsis.org](http://www.narsis.org)) are used to help identify such work. The Secretary of State has recently announced DFID support to a new African Agricultural Technology Foundation, on which the Africa Directorate collaborates closely with the Agriculture and Central Research Teams in Policy Division.

The Europe, Middle East and America's directorate, encourages its country offices to facilitate lesson sharing and collaborative policy research between country offices, and the other Regional Directorates and Policy Division. Two recent examples of collaborative policy work are lesson sharing between policy makers in Brazil and Russia on HIV/AIDS.

Some researchable problems are not country-specific, and we recognize therefore that DFID's Central Research effort will apply across regions and globally. Central Researchers work with DFID country offices and developing country governments, to ensure that research is relevant and that means exist for the outputs to be taken up and used, including at country level.

Following the recent restructuring within DFID, responsibility for capacity building in country will remain led by country offices and Regional Directorates, rather than the Central Research Department. However, the new Research Strategy is likely to propose that DFID supported research fully involves developing country researchers. The Central Research Department will also improve the systems it has for managing the knowledge produced by research it commissions, and will review how this feeds into wider DFID knowledge management and lesson learning systems, as part of the new DFID research strategy.

8. *Witnesses undertook to provide further statistics on the number and proportion of research projects which DFID has contracted to British and British-led groups. It would be helpful to have these figures for each of the last five years.*

Information on this question is not readily accessible. DFID is undertaking an exercise to compile this data, and we will forward this to the Committee under a separate cover in the near future.

9. *In reaching decisions on the award of research contracts, what consideration is given to level of participation by developing countries, the proximity of the project to its place of application and any cost disadvantages applying to UK and other institutions?*

The participation and leadership of developing countries is central to the research that DFID commissions. Research does not take place in a vacuum, it always takes place in the context of partnerships, usually involving a range of different developed and developing country participants. It therefore includes an element of capacity building. The nature of the research will determine its location. Some research needs to be done in advanced research institutes in the UK or in other developed countries. However much of DFID's research is applied or adaptive, and takes place in developing countries. Cost-effectiveness and value for money considerations are assessed in competitive tenders for new research commissions, and DFID covers full economic costs.

10. *Which countries do not have tied research aid, and which countries have undertaken to untie research aid since the UK International Development Act 2002 was passed?*

All donors have agreed to untie their official development assistance to least-developed countries, in line with the OECD/DAC Recommendation in 2002. However, there is as yet no similar agreement to untie technical co-operation, and research is defined as "free standing technical co-operation" and so is explicitly excluded from the untying agreement. All donors have made a commitment to achieve improved aid effectiveness and harmonization of their aid procedures. The UK believes that untying technical co-operation and other forms of aid would make a significant contribution to greater aid effectiveness, through

more competitive pricing, appropriate sourcing and reduced transaction costs. DFID fully untied its aid in 2001, and has since been working to encourage other donors to follow suit. Several other EU member states including Sweden and Ireland have also fully untied their aid.

Although there are no international official records on the extent to which donors untie their research aid, anecdotal evidence suggests that a large proportion of research aid remains tied. There are exceptions: most Dutch, Swedish and Irish development research aid is untied, and some 30% of Denmark's. The EU's research programmes operate through EU wide tenders—with in some cases a requirement of both developed and developing country participation in North-South partnerships.

Support for international research collaborations—which DFID is encouraging—tends to be less often tied to the donor country's institutions. For example an estimated 90% or more of USAID's funding for the Consultative Group on International Agricultural Research (CGIAR) is untied.

Most Foundations, such as the Bill and Melinda Gates Foundation or the Rockefeller Foundation, do not tie their research to particular countries' suppliers, and are an important source of funding for both UK and developing country scientists.

March 2004

## APPENDIX 73

### Memorandum from the Foreign and Commonwealth Office

#### INTERNATIONAL DEVELOPMENT AND THE ROLE OF SCIENCE

1. The Science and Technology Committee has requested information on the number and proportion of Foreign and Commonwealth Office (FCO) Chevening Scholarships that have been made in science, engineering and technology fields in each of the last five years, along with details of how the subsequent employment of scholars is monitored and how countries' poverty reduction strategies are taken into account in decisions on the award of scholarships.

#### NEW CHEVENING SCHOLARSHIPS (CONTINUERS ARE NOT INCLUDED)

<i>Academic Year</i>	<i>All Awards</i>	<i>Science and Technology and Engineering Awards #</i>	<i>Science and Technology and Engineering Awards as a percent of all</i>
2002–03	2,387	156	6.54
2001–02	2,284	128	5.60
2000–01	2,285	145	6.35
1999–2000	2,022	205	10.14
1998–99*	1,607	123	7.65

\* 1998–99 does not include scholarships under the Central Jointly-Funded (CJF) chapter of Chevening because this data is not readily available. CJF scholars are funded jointly by a sponsor, a higher education institution and the FCO. CJF awards are included in the table for 1999–2000 to 2002–03 (they represent 99, 35, 24 and 51 of the awards in Science and Technology and Engineering).

# Not including Computing and IT or Sociology and other Social Sciences.

The FCO tasks the British Council, under a Service Level Agreement for the management of the Chevening Programme, to maintain alumni databases and to provide information on alumni professions. Many Embassies and High Commissions hold annual receptions for Chevening alumni and invite them to specific events. The careers of Chevening alumni are monitored through these means. The FCO recognises that further work on alumni follow-up will be needed to address the weaknesses identified in "The FCO Scholarship Review". It envisages improving performance partly through drawing up robust guidelines on alumni follow-up and rewarding good practice by Posts in the allocation of scholarship funding. It may be that the online application system for Chevening Scholarships, which the FCO is piloting, could be developed into a global alumni database in due course.

Countries' poverty reduction strategies are not a key criterion in decisions on the award of Chevening scholarships. The prime candidates for the Chevening Programme are postgraduate students and young professionals in early or mid career, who display both intellectual ability and leadership potential—the future generation of leaders, decision-makers and opinion-formers. Candidates should have established a proven track record of success and should have the potential to rise to positions of power and influence in their own countries where they might help to further UK political, diplomatic, commercial, and other interests in the mid or longer term. They may come from a wide range of academic disciplines or professional

backgrounds in both public and private sectors—politics, government, Civil Service, media and business—and should be relatively young (normally 25–35). The Department for International Development provided its own Chevening scholarships until the end of 1998–99 and these were awarded on development criteria.

2. The Committee has asked for a note on the scope of the current review of the Chevening Programme.

Independent consultants (River Path Associates) undertook the FCO Scholarship Review. The Foreign Secretary informed the Foreign Affairs Committee of the outcome by letter dated 16 January 2004. Copies of the Review are in the libraries of both Houses.

The terms of reference for the Review are attached (Annex A). The 49 recommendations of the Review deal mainly with the FCO's Chevening Programme. The FCO proposes to:

- (a) pilot a new stream of Chevening Fellowships in 2004–05 aligned to one or two subject areas of strategic interest to the FCO (see the FCO Strategy document, "UK International Priorities"<sup>110</sup>). Chevening Fellowships will be a new opportunity for mid-career professionals to come to the UK for three months to undertake high quality short-courses;
- (b) revise the methodology for the distribution of funds for Chevening Scholarships, to give a greater concentration on countries of long-term strategic interest to the UK, in line with the new, recently promulgated FCO Strategy document, "UK International Priorities".<sup>111</sup> We aim to introduce changes in time for the selection round beginning in summer 2004;
- (c) examine current co-sponsorship arrangements in detail to ensure they contribute to the achievement of FCO objectives;
- (d) simplify procedures for the management of Chevening, including a new on-line application process; and,
- (e) keep the Chevening brand name, which has now achieved significant recognition overseas.

The changes proposed should deliver a better-focused and managed Chevening Programme, more closely attuned to FCO strategic priorities.

March 2004

#### Annex A

The FCO Scholarships Review had the following terms of reference: To examine:

1. The FCO's investment in the Chevening Scholarships Scheme, the Marshall Scholarships and the UK's contribution to the Commonwealth Scholarship and Fellowship Programme.
2. The impact of this investment against FCO strategic priorities.
3. Ways to maximise the impact of this investment and how the benefits might be enhanced through more effective programme strategy and management, aftercare, alumni associations and networking.
4. The nature and impact of investment in these scholarship programmes by other government departments, the higher education sector, and private sector sponsors.
5. Proposals for new scholarship programmes, such as the Chevening Science Scholarships.
6. Various strategies to meet the Prime Minister's target of up to 3,000 Chevening scholarships a year by the academic year 2005–06 including, but not limited to:
  - (i) Funding more short courses.
  - (ii) Capping scholarship funding at a fixed level.
  - (iii) Concentrating resources on fewer countries.
  - (iv) Ways to ensure maximum flexibility in the allocation of scholarships to reflect changing strategic priorities.
  - (v) Possible synergies and efficiencies from restructuring, rebranding or combining Commonwealth, Marshall and Chevening.
  - (vi) Options to maximise efficiency savings in managing the scheme, including internet-based selection procedures, and allowing the private sector and educational institutions to take on more of the management and funding of parts of the scheme.
  - (vii) Appointing a private sector champion to help raise funds from the private sector.

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<sup>110</sup> 1 ISBN 0-10-160522-6.

<sup>111</sup> 1 ISBN 0-10-160522-6.

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## APPENDIX 74

### Memorandum from the Open University

The Open University has a strong and increasing commitment to contribute to the development of science and technology capacity in developing countries. Open University initiatives in this area can be grouped primarily in four main areas: distance education technologies, teacher education, biosciences research, and interdisciplinary science and technology research in development. Most of this work is carried out in partnership with colleagues in developing countries.

#### 1. DISTANCE EDUCATION TECHNOLOGIES

The Open University's expertise in distance learning is constantly requested by a wide range of distance learning providers overseas, for both longer and small projects. It has a major collaboration with the Arab Open University; other collaborations include the Indira Gandhi University, India, UNISA in South Africa, the Civil Services College, Ethiopia and the Open University of Tanzania.

#### 2. TEACHER EDUCATION

The OU has been strongly committed, not only to technology capacity building in distance learning in developing countries, but also to developing countries use of teaching materials in Science and Technology, including ICT.

Current projects include the Teacher Training in Sub-Saharan Africa (TESSA) programme, the Digital Education Enhancement Project (DEEP) in South Africa and Egypt, and the Medical Education Project in Bangladesh.

##### *Teacher Training in Sub-Saharan Africa—the TESSA Programme*

The TESSA project has been jointly planned by a consortium of international and national organisations and institutions including The Commonwealth of Learning, The University of Fort Hare (South Africa), The Open University of Tanzania, and The BBC World Service Trust led by the Open University (UK). The aim is to provide the resources and strategies to assist in the education and training of unqualified teachers working in the primary schools of Sub Saharan Africa. There are currently 44 million children of primary school age out of school in the region. The 2000 millennium goal is to provide basic education for all by 2015 and with that must go a commitment to the supply and quality of Teachers. The TESSA project will research and develop locally drafted school based resources and associated "training the trainer" resources. This work will build on over 10 years' co-operative experience in the region and will make use of, where possible, the latest forms of information and communication technologies.

*The Open University is at present giving priority to seeking major support for the TESSA programme. There has been ministerial interest at the DfES and we are seeking a consortium of funders, public and private, for this important initiative.*

##### *DEEP—the Digital Education Enhancement Project*

DEEP is funded by the Department for International Development (DfID) UK, to research the use of new technologies to support future forms of teacher development and investigate the ways in which educators can use ICT to improve teaching and learning in numeracy, science and literacy. Success at introducing effective ICT support in primary schools in the first phase has led to scaling up in Egypt, and DEEP has been nominated for the prestigious Petersberg prize. DEEP is a partnership between: the Centre for Research and Development in Teacher Education in the Open University, the University of Fort Hare, Eastern Cape, South Africa and the Programme, Planning and Monitoring Unit of the Egyptian Ministry of Education in Cairo, Egypt. DEEP has also been supported by Microsoft and Hewlett Packard.

##### *Medical Education*

As part of an education research project in medicine, the Science Faculty has been involved in working with Doctors in Bangladesh and India to help develop distance teaching courses in areas such as diabetes prevention and care, and AIDS. The projects have included feasibility studies on location to determine facilities and abilities, workshops to develop teaching and materials in a distance learning context and workshops to develop tutor skills in distance learning and assessment.

The first course, on Diabetes, is being presented by the Bangladesh Diabetic Association in Dhaka and started with first presentation in February 04. It will run twice a year (6 months for a single presentation) and lead to the Distance Learning Certificate course on Diabetology.

### 3. BIOSCIENCES AND DEVELOPMENT

#### *Innogen—the ESRC Centre for Social and Economic Research on Innovation in Genomics*

INNOGEN is part of the ESRC Genomics Network, three Centres across the UK studying the evolution of genomics and life sciences and their far-reaching social and economic implications. INNOGEN is based jointly at the University of Edinburgh and in Development Policy and Practice at the Open University and has a strong development interest. Research projects include:

#### *Genomic and biotechnology partnerships in less developed countries*

These projects examine North-South and South-South partnerships in agricultural and pharmaceutical related biotechnology and genomics in Latin America, Asia and Africa. Biotechnology can play an important role in economic and social development throughout the world, but a range of potentially powerful constraints may limit the potential of biotechnology to provide these benefits in less developed countries. This project aims to examine the role, efficacy and potential of biotechnology and genomics partnerships and networks to provide concrete economic, agricultural, and health benefits. The project aims:

- To understand in detail north-south public private research partnerships;
- To investigate the relationship between partnerships and broader innovation systems;
- To map comprehensively the types of biotechnology and genomics partnerships that exist in the case study regions;
- To map the different ways in which benefits may be derived from partnerships;
- To understand and highlight policy and institutional best practice for supporting biotechnology/genomics partnerships; and
- To engage meaningfully in policy and capacity-building fora.

#### *Making the Biosciences Work for the Poor*

##### Exploring Science/Development/Innovation Interrelationships

Research within Innogen has argued that in order to facilitate the transformation of bioscientific advances into direct benefits for the poorest and most vulnerable, more critical understandings of the role partnerships play in development and innovation systems are needed. It is important to understand the internal dynamics within partnerships in order to understand these powerful political, economic and cultural interrelationships. A culturally embedded critical reading of partnerships can help map these dynamics and foster more focused, more coherent and more relevant partnerships with respect to bioscientific innovation and development.

### 4. SCIENCE AND TECHNOLOGY IN DEVELOPMENT

The International Development Centre at The Open University has been recently set up to build effective partnerships with colleagues from around the world, to carry out research and teaching of direct relevance to development; it supports a range of projects in science and technology. One of the Centre's co-directors is a scientist/engineer, which indicates The Open University's commitment to science and technology in development. Current Open University research projects of relevance to development include:

#### *HIV—Mechanisms of brain damage in HIV-associated dementia*

A significant proportion of AIDS patients develop a cognitive, motor and behavioural condition termed HIV-associated dementia (HAD). There is little evidence that HIV damages neurones directly; rather, the damage appears to occur indirectly via proteins shed from the virus itself or even via toxic factors secreted by infected cells. The brain has its own protective mechanisms to prevent and restore the function of neurons following initial damage. This is achieved by increasing the brain levels of protective molecules termed neurotrophins. Astrocytes, a cell type of the brain that constitutes a major source of neurotrophins, are infected by HIV. However, the question of whether HIV infection modulates the neuronal supportive functions of astrocytes has not been addressed yet. Dr Ignatio Romero's research has recent data indicating that HIV infection of human astrocytes isolated from fresh brain tissue induces a loss in their capacity to secrete a key neurotrophin, Nerve Growth Factor. We are at present investigating whether an imbalance between the extent of neuronal insult and endogenous neuroprotective mechanisms provided by astrocytes may lead to neuronal death and aggravate brain pathology in HAD.

*Growth of the Indian software industry*

This OU research by Dr S Athreye has demonstrated that:

- (a) US firms were very important to the technological catch-up by Indian firms as clients of the Indian firms. In the long term this has been an advantage for US firms as they have been able to benefit from the productivity improvements made by Indian firms due to software outsourcing.
- (b) the research also shows that links between the Indian diaspora in the US and Indians in India were important in many ways to establishing such outsourcing links. Expatriate Indian managers often “screened” Indian firms and also managed the outsourcing process. In their role as entrepreneurs they acted as a link between Indian firms and markets abroad.

The ability and potential of immigrant populations to contribute to economic activity in their adopted country lies in the extent to which they are allowed to occupy managerial positions in industry. In such positions they can exercise managerial control based on their (private) and publicly available information. What is quite striking in the study of Indian software is how many Indians were prominent as senior management in US multinationals. This appears not to be the case for the UK, and even in cases where one can find such examples such managers have risen in rank in the establishment through the US subsidiary of UK multinational.

Thus, despite spending more by way of educational aid and having a longer history of business links to and emigration from India, the UK economy has not benefited from these links in the same ways. The Indian and Chinese communities may have added to the cultural variety of Britain but have been smaller players in the integration of the resources of their home economies to the advantage of the UK economy. This is an area that clearly needs more research by governmental agencies, especially in the context of the current plans by the Home Secretary to encourage skilled migration into the economy.

*Digital divide—cross-cultural access to ICTs*

The research of Professor Pat Hall of the Maths and Computing Faculty has focused on language issues exploiting developments in software and language engineering. He was initially funded by the EU under the Framework programs, and more recently by EuropeAid in the Asia IT&C programme to develop contacts in computational linguistics and software localisation between researchers in South Asia and Europe. Through this project and its final conference in Kathmandu Nepal, it has become evident that making ICTs accessible in local languages requires more than simply translating the software to the local language; if a language is to be supported properly and not be doomed to a slow death it must be provided with all the computational support taken for granted in Europe and the US, critically important for sustainability. A society using that language must be enabled to join the information society still using that language, and projects to do this are now being formulated.

The barriers to access to ICTs include not just language but also culture. Dr Shailey Minocha has been looking at cross cultural factors in e-Commerce, looking at cultural markers that would make global commerce on the web acceptable, or otherwise. She has studied systems in India and in Taiwan. Jose Abelnour-Nocera has been looking at an ERP software system sold globally and how its embedded best (western) practice causes problems in use in the Far East, Central America, and even within Europe.

*Waste management in sub-Saharan Africa*

This research by Dr Gordon Wilson and Dr Hazel Johnson has investigated partnerships for learning and innovation in relation to, among other environmental health issues, waste management in sub-Saharan African countries. It has involved two studies. In both studies the local state lacks the resources and capability and the private sector the capacity to deal with a burgeoning waste management problem. The first study was in Zimbabwe and investigated a partnership in an urban municipality that involved local civil society, a national environmental NGO, the local private sector and the local state. It examined the dynamics of joint problem identification, the process of developing joint innovative solutions and the identification of key stakeholders. The second study concerned Uganda and investigated two Uganda-UK municipal partnerships that are conceptualised as “practitioner-to-practitioner”—environmental health officers and related engineers interacting and sharing and adapting models of practice to the local context.

*E-learning to help train climate change negotiators from developing countries*

Stephen Peake holds an EC/UN research grant to study the potential of e-learning to help train climate change negotiators from developing countries. The study is part of a flagship 1 million euro capacity building project to enhance the effectiveness of energy and environmental centres in South Africa, Senegal and Sri Lanka. The lead agency in the project is UNITAR, the United Nations Institute for Training and Research. The project could be viewed as “technology transfer in action”. The project will improve the centres’ distance learning capabilities which in turn will strengthen their national and regional capacities to play fuller parts in international environmental governance. The project accesses cutting edge expertise from

the Open University's Institute of Educational Technology and Knowledge Media Institute to deliver bespoke e-learning and knowledge management solutions to the centres specific needs. The project blends the best of the OU's international development, e-learning and knowledge management expertise.

#### *Social policy*

Professor Maureen Mackintosh at the Open University is working with UNRISD, the United Nations Research Institute for Social Development in Geneva, helping to build up their research programme on Social Policy and Development. She is co-ordinating for UNRISD two collaborative research projects in the area of Globalisation and welfare, both focusing on health care. Both projects investigate the interaction of commercialisation and globalisation in health care, examining the effects on inequality and the scope for universalisation of access to care. The project draws together researchers from Africa, Asia and Latin America, as well as Northern academics.

In addition, a collaborative project between the Ghana Medical School and the OU, supported by the WHO and UNRISD, is investigating the costs to Ghana of the out-migration of a large numbers of Ghanaian health care staff to the UK and USA. The IDC aims to build up a broader programme of work in social policy and development.

#### *Transnational Networks in Development*

The governance of development is changing. Not only has the range of institutions responsible for development proliferated at global, national and local levels, but information and communications technologies enable more rapid interaction between disparate groups. These changes have presaged the rise of transnational networks. Such networks are evident across a range of developmental arenas from states, to multilateral institutions and civil society or, more often than not, straddling all three arenas. In different ways these networks are changing the architecture of development governance. However, the operation and effectiveness of these networks has not been subject to critical examination. Research within DPP being conducted by Giles Mohan, Helen Yanacopulos and Leroi Henry seeks to compare different developmental networks, to understand more fully the power relations operating within them, and their effectiveness. Specifically these are debt relief campaigns and Ghanaian hometown associations. Findings so far include:

- Flexibility is a political asset, but it can be undermined by the lack of strategic co-ordination. Networks can prove “slippery”, which makes them effective forms of resistance, but at the same time they may lack the weight to hold some powerful institutions to account;
- Information is a key resource within networks and it can be moved rapidly and proliferate in unforeseen ways. However, conflicts emerge over which discourses rise to the top and become the “official” voice of the network;
- Apparent shared values within networks conceal quite significant differences so that like any “community” these networks are riven by inequalities.

*March 2004*

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## APPENDIX 75

### **Memorandum from the British Council**

Out response is restricted to the first and last terms of reference, concerning co-ordination with Government policy and training provision.

As the UK's international organisation for education and cultural relations, the British Council has a unique role in connecting millions of people to the creativity and scientific innovation of the United Kingdom in the 110 countries it works in. The UK's success in scientific research is a major element of its national creativity and it is vital for its global economic position that this continues to be recognised internationally. But science also provides a common platform for collaboration, discussion and for the pursuit of common understanding which is critical to overcoming deep cultural divides. Thus the universal language of science encourages the mutual understanding essential for a more peaceful, secure and economically prosperous world.

The British Council's science sector has a global budget of £8 million with dedicated science programmes in 62 countries, including China, Brazil, India, Egypt, Malaysia, South Africa, Thailand, Iran, Mexico, Ghana, Cuba, Bangladesh, Zambia, and Libya. India is given as a case study in the first annex to this memorandum, to illustrate some of the range of our work in science. Under its Strategy 2010, the Council will increase funding for science in pursuit of the key objectives of promoting international research collaboration to the benefit of the UK's science base and establishing awareness of the UK as a world leader in S&T.



In its work linking the UK education sector with those of all 110 countries it works in, the Council aims, as part of the cross-departmental strategy, to assist in making the UK the preferred partner in research collaboration and in co-operation between higher education institutions.

In many developing and transitional countries, the British Council is developing a network of ICT-based Knowledge and Learning Centres, which provide opportunities for on-line and video-conferencing access to global information and knowledge, particularly from the UK, for students and professionals of all disciplines. In parts of Africa, such as Ghana, this network is being developed in partnership with the World Bank's Global Distance Learning Network (GDLN). This network, which will cover fifty countries by 2005–06, will also facilitate networks of young and future scientists with particular reference to the offer in the UK in S&T.

The two programme areas of the Council's science, engineering and environment sector deliver against the corporate objectives of i) increased scientific collaboration through the exchange of ideas, knowledge and information between young people in UK and other countries, and ii) greater international awareness of the UK's role in scientific creativity and innovation. The former area targets scientific communities, engineers and research managers around the world, through face-to-face meetings and networking. The latter targets the public, policymakers and other interest communities and operates through exhibitions, public debates and lectures, seminars, events and web sites. The dual emphasis on collaboration and awareness raising recognises, for the former, the demand overseas for symmetrical co-operation where both sides can learn from each other in developing new knowledge and skilled people, and for the latter, the need to promote the UK as a global hub for science and technology.

In so doing, the British Council adds value to two of the Government's six policy goals for international S&T promotion, defined in the 2000 White Paper on Science and Innovation, "To establish awareness of modern Britain as a world leader in science and technology as an important means of advancing our general political influence on the world stage", and "To promote international research collaboration to the benefit of the UK science base". The Council is a member of the two interdepartmental groups tasked with co-ordinating the Departmental interests and resources involved in international S&T promotion, chaired by OST and UKTI.

For collaboration, the Council's International Networking for Young Scientists (INYS) scheme is an initiative that supports the Council's purpose of "nurturing mutually beneficial relationships with other countries", by encouraging and facilitating the mobility of, and direct contact between, young researchers. It supports face-to-face meetings between young scientists and engineers from the UK and other countries, for the exchange of ideas, knowledge and information and the building of international connections that assist the innovation process. In 2003, INYS events were run in seventeen countries, including China, Egypt, India and Zambia, on topics ranging from reproductive biotechnology to climate change.

For awareness raising and debate, in 2004–05 the Council will deliver a major campaign on meeting the challenge of climate change. "ZeroCarbonCity" will include a survey of 100 cities around the world, indexing their efforts to help reduce greenhouse gas emissions, an online global debate, city debates, an exhibition on climate modelling, and talks by UK science "ambassadors". 2005 is a critical year for the UK because i) negotiators will begin to explore post-Kyoto commitments under the UN Framework on Climate Change, with the UK expected to play a positive role in the negotiations; ii) the UK will host the G8 summit and press for renewed G8 action to tackle climate change; and iii) the UK will assume the EU Presidency in the second half of the year, with the Government expected to provide leadership as Europe attempts to meet its Kyoto commitments and begins to negotiate future climate change agreements.

Turning to the provision of training, the British Council manages DfID's Higher Education Links scheme, which is based on areas of mutual interest and supports open-ended partnership. Out of a current total of about 400 links, 35 are in science and engineering disciplines and a further 25 in the areas of food science and technology, environment, marine biology and water resource management. Six examples are given in a second annex to this memorandum, from South Africa, Sri Lanka, Egypt, Tanzania and China, covering public access to science and technology, solar energy, food hygiene, transport, biodiversity, natural resource management and medical instrumentation. The emphasis is on capacity building through the training of skilled people and development of partnerships.

The Chevening Scholarship Scheme is an FCO programme targeted at graduates in 150 countries world-wide, and managed by the British Council. We understand the FCO will submit details of this programme to the Inquiry.

*March 2004*

BRITISH COUNCIL INDIA'S SCIENCE PROGRAMME

INDIA WORK PROGRAMME FOR 2004–05

- Indo-UK symposium on Global Climate Change (October 2004)
- Meet the Scientist' programme, with high-level UK "ambassadors" for science (May 2004–March 2005)
- Creativity in science: visits by UK professionals (May 2004–March 2005)
- India UK Young Scientists Networking Conference 2004 (December 2004)
- Reciprocal visits to follow up the 2002 and 2003 Networking Conferences (April 2004–March 2005)
- Workshop for wildlife film makers (October 2004–March 2005)
- Developing partnership between the Eden project and the key Indian institutions working in the area of environment education through the "Gardens of life" project (April 2004–March 2005)
- Workshops and outreach programmes for the Science Educators' Network (April 2004–March 2005)
- Workshop in environment and science journalism (April 2004–October 2004)
- Telecommunications internships (April 2004–July 2004)
- Videoconferences on current topics in science (April 2004–March 2005)

SECOND INDIA UK YOUNG SCIENTISTS' NETWORKING CONFERENCE (27 NOVEMBER TO 5 DECEMBER 2003):  
NETWORKING ESTABLISHED BETWEEN

Dr Teresa JT Pinheiro, Royal Society University Research Fellow, Department of Biological Sciences,  
University of Warwick

And

Dr Raghavan Varadarajan, Associate Professor, Molecular Biophysics Unit, Indian Institute of Science,  
Bangalore

Dr Spencer J Sherwin, Reader, Department of Aeronautics, Imperial College London

And

Dr Sanjay Mittal, Associate Professor of Aerospace Engineering, IIT Kanpur

Dr Russell Naven, Project Officer, LHASA Limited, Department of Chemistry, University of Leeds

And

Dr Alok Dhawan, Scientist, Industrial Toxicology Research Centre, Lucknow

Dr Andy Brown, Senior Experimental Officer, Electron Optics Institute of Materials Research, University  
of Leeds

And

Dr Mukul Chandra Paul, Scientist, Fibre Optics Laboratory, Central Glass and Ceramic Research  
Institute (CSIR Lab) Kolkata

Dr Yadvinder Malhi, Royal Society University Research Fellow, School of GeoSciences, University of  
Edinburgh

And

Dr P Sudha/Professor Raman Sukumar, Centre for Ecological Sciences, Indian Institute of Science,  
Bangalore

Dr Angela Frodsham, The Wellcome Trust Centre for Human Genetics, Oxford

And

Dr Anindita Kar-Roy/ Dr Shahid Jameel, Associate Scientist and Group Leader, Virology, International  
Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi

Dr F Causa, Optoelectronics Lab, University of Bath

And

Dr Arnab Bhattacharya, Department of Condensed Matter Physics and Materials Science, TIFR,  
Mumbai

Dr Mark Harris, Senior Lecturer in Virology, Division of Microbiology, University of Leeds

And

Dr Saumitra Dass, Department of Microbiology, Indian Institute of Science, Bangalore

Dr Craig P Smith, Royal Society Fellow Lecturer, Molecular Cell Physiology Unit, University of Manchester

And

Hyder Usman/Dr M K Matthew, National Centre for Biological Sciences, Bangalore

Dr Mark Wright, MRC Clinical Scientist, Faculty of Medicine, Imperial College, London

And

Dr B C Sharma/Professor S K Sarin, Lecturer, Department of Gastroenterology, GB Pant Hospital, Delhi

Dr Tim Craft, Department of Mechanical Aerospace and Manufacturing Engineering, UMIST, Manchester

And

Dr Anupam Dewan, Associate Professor, Department of Mechanical Engineering, IIT Guwahati

*Examples of links developed:*

Link between the School of Pharmacy, University of London and the National Institute of Pharmacy Education and Training (NIPER), India on “Development of Pharmacy Practice in India” (April 2002 to March 2005)

**Aim:** To upgrade the level of pharmacy profession in India by creating a “Centre of Pharmacy Practice” with UK’s support to train young and practising pharmacists.

The link, which is in its final year, has developed NIPER’s capacity in clinical pharmacy and community and rural pharmacy especially on medicine management and cost effective and safe use of medicines. NIPER is India’s leading institution on pharmacy practice and is developing a post-graduate curriculum for pharmacists with UK support. The link has also helped in the area of identification of drug related problems and on studies aimed at drug abuse, pharmacy components in family planning programme and forensic requirements. The programme involved exchange of tutors and professionals between the University of London and NIPER.

Link between the University of Derby and Jawaharlal Nehru University on “Biogeochemical studies of some metals and organics in aquatic and terrestrial ecosystems” (April 2001–March 2004).

**Aim:** To develop collaborative research on assessing heavy metal toxicity in floodplain soils in Delhi and the resulting eco-toxicity.

The link, which has just ended, helped in bringing a wider academic collaboration among research groups in India and the UK. Joint investigations and sampling strategies have helped in developing baseline data on elemental contaminants in selected ecosystems in Delhi, resulting in formulation of future plans. Joint papers presented in seminars in the UK have resulted in a strong India-UK network, and the collaboration will continue without link support.

**Annex 2**

SIX EXAMPLES OF HIGHER EDUCATION LINKS

*South Africa—link between Sheffield Hallam and University of Zululand; 1998–2003*

**Aim:** To develop University of Zululand’s Science Centre by promoting access to S&T facilities and resources in disadvantaged communities.

Launched 1998, which was SAF’s “Year of S&T”. 20,000 + pupils visited Science Centre (which acquired a large range of exhibits as a result of the link), 25 Centre staff trained, delivery of series of workshops at the Centre for teachers to support classroom delivery (400 + teachers trained), development of portable science demonstration kit for use by teachers in rural secondary schools, local co-ordinator Derek Fish made President of the South African Association of S&T Centres (membership growth and presentations at conferences).

Derek Fish has stated of the link “The educational initiative, which started out as more academic in nature, has blossomed into a far reaching initiative which has had practical impact all over South Africa, but especially at the University of Zululand Science Centre. It could well prove to be the catalyst for getting Science Centres started all over the continent”.

*Sri Lanka—Link between Sheffield Hallam and seven institutes in Sri Lanka—Peradeniya, Colombo, Kelaniya, Moratuwa and Ruhma + Energy Forum); 1992–98*

**Aim:** To promote solar energy

The link supported the development of a new model of solar panel using different materials, which has shown how cost of solar energy can be reduced and efficiency of solar cells improved. This has been cutting edge research (low-cost, high-efficiency thin-film cells with electrodeposited semiconductors)—called

electrodeposition. The link evolved into a wider international renewable energy promotional programme—SAREP covering 7 countries in Asia (includes India, Pakistan, and Bangladesh). SAREP has set up village Centres for Applications of Renewable Energy Sources (CARES). Over 60 public awareness lectures have been undertaken and funding obtained from other bodies, including £105k from EPSRC. A typical system costs £300 and lasts 20 years (cheaper than kerosene that many rural people rely on, but initial outlay high). The target group are rural poor—the “Village Power” project aims to bring affordable solar power to rural households not connected by the national electricity grid (almost  $\frac{1}{2}$  the Sri Lanka’s population in this position and further 1.7 million can only afford kerosene lamps and wood fires for cooking).

*Egypt—link between University of Westminster and High Institute of Public Health, Alexandria; 2000–06*

**Aim:** To develop the skills of the Ministry of Health Food Inspectors in Egypt and target the need for stricter laws that would ensure safer food for the poor consumer.

In second term but achievements in first 3 years: 135 Food Inspectors trained (50% women), regulations concerning importation of food aligned with that of EU countries

*Tanzania—link between Leeds Metropolitan University and National Institute of Transport (NIT); 2003*

**Aim:** To improve NIT’s capacity to train transport management experts, transport planning, automobile engineering and road traffic safety experts and operatives (drivers, mechanics, conductors etc). Road safety is a key problem in Tanzania.

*Egypt—two links between Universities of Nottingham and Suez Canal in biological sciences: (i) Biodiversity of the Sinai desert ecosystem; 1993–98 (together with St Andrews) and (ii) Natural Resources and the Bedouin of Sinai; 2000–06 (together with the Institute of Education, University of London)*

There have been many spin-offs from the links. The main one has been the establishment of a Society to promote Egypt-UK dialogue in biology, which runs conferences, seminars and workshops as well as producing two journals (see <http://www.nottingham.ac.uk/plzfg/EBBSoc/ebbsoc.html>). The links have also been instrumental in changing the Egyptian university curriculum and promotion procedures for academics, and have produced national guidelines for scientific collecting. The link partners also work in Sinai, and are strong supporters of the St Katherine Protectorate. They are in the third year of running joint undergraduate field courses with mutual exchanges of students and staff.

*China—link between UMIST and Chinese Academy of Sciences; 1999–2002*

This resulted in the joint development of “the world’s best capacitance tomography system” and also the development of the world’s first square ECT sensor system. It attracted over £100k in additional funding and produced around 30 publications.

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## APPENDIX 76

### Memorandum from UK Trade and Investment

#### INTRODUCTION

UK Trade and Investment is the Government organisation that supports companies in the UK trading internationally and overseas enterprises seeking to locate in the UK. UK Trade and Investment’s objective, set out in its Public Service Agreement, is to enhance the competitiveness of companies in the UK through overseas sales and investments; and attract a continuing high level of quality foreign direct investment:

- To deliver a measurable improvement in the business performance of UKTI’s international trade customers; and
- To maintain the UK as the prime location in the EU for foreign direct investment.

UK Trade and Investment brings together the work of the Foreign and Commonwealth Office (FCO) and the Department of Trade and Industry (DTI) in support of international trade and investment. It has an annual budget of £290 million. It deploys 2,500 people, including more than 1,500 overseas and 330 in the English regions. It assists over 20,000 businesses annually. UK Trade and Investment achieves this through teamwork: a unified organisation delivering through an intelligent, customer focused global network.

UK Trade and Investment supports companies in the UK, and overseas companies investing in the UK, to build their international business success. It is not therefore UK Trade and Investment’s function to promote capacity building and research partnerships, though from time to time these may result from eg the

transfer of technology or skills in an overseas investment or collaboration. Capacity building and research partnerships are the main responsibility of the Office of Science and Technology and the Department for International Development.

UK Trade and Investment does not lead, either, on trade policy questions (market access, tariff and non-tariff barriers to trade, WTO, GATT and GATS issues), though they can have a significant impact on the success of UK firms wishing to do business in overseas markets. These issues are the responsibility of Europe and World Trade Directorate in the DTI.

#### PERFORMANCE MEASURES

UK Trade and Investment has impact assessment and performance measures to ensure that services contribute to economic prosperity and represent value for money. In order to evaluate performance, progress against its Public Service Agreement target is assessed against four key indicators:

- at least 30% of new-to-export firms assisted improving their business performance within two years of receiving UKTI support (currently 37%);
- at least 50% of established exporting firms assisted improving their business performance within two years of receiving UKTI support (currently 42%);
- at least 70% firms receiving assistance to win major overseas projects reporting that UKTI's help was a significant factor (currently 58%); and
- the UK's share of the stock of EU foreign direct investment as recorded in the UNCTAD World Investment Report to be the best in Europe on a year-by-year basis (currently 22%).

#### AID-FUNDED BUSINESS

UK Trade and Investment's Development Business Team aims to raise UK firms' awareness of the extensive opportunities available from aid-funded business and to help firms access these opportunities. The Development Business Team liaise with all the main international aid-funding agencies including the World Bank Group, the European Commission, the United Nations agencies, the various Regional Development Banks and with the UK Department for International Development (DFID). The Development Business Team works closely with private sector multipliers such as Business Links and Chambers of Commerce as well as with diplomatic missions overseas to help UK firms win a greater share of multilateral aid-funded business. This includes consultancy work, supplies and works.

#### INNOVATION: SCIENCE AND TECHNOLOGY CO-OPERATION

The *Global Links* chapter of the DTI's recent *Innovation Report* noted that, "Our international innovation agenda should be driven by the contribution it can make to wealth creation in the UK. International trade and investment, which are UK Trade and Investment's prime responsibility, are major drivers for stimulating innovation. UK Trade and Investment will take responsibility for the international innovation agenda by ensuring that government coordinates its action in this area." (7.33.)

UK Trade and Investment's Chief Executive chairs a cross-departmental International Science and Technology Trade and Investment Committee, focussing on how science and technology can contribute to wealth creation for UK businesses through international partnerships and collaborations. The Committee has recently defined its role in support of the *Innovation Report*, covering four main areas:

- Information sharing across Government departments.
- Development of a cross-departmental strategic approach towards key international markets (eg China, India, the USA).
- Cross-departmental planning on key initiatives (eg prime ministerial and ministerial visits and speeches, public diplomacy campaigns).
- Single focal point for international aspects of other Government departments' science and technology initiatives.

At present, the Committee includes only the FCO, DTI, British Council, Office of Science and Technology, Research Councils, the Regional Development Agencies and UK Trade and Investment, though there are plans to widen its membership.

April 2004

## APPENDIX 77

### Memorandum from the Department for Environment, Food and Rural Affairs

#### RESPONSES TO THE QUESTIONS OF 17 MARCH 2004

*A. What steps does Defra take to ensure that scientific and technological research conducted under a Defra umbrella is used for the benefit of developing countries?*

Not all research financed by and/or conducted under the Defra umbrella is necessarily of direct relevance to developing countries. However where possible we aim to ensure that research has potential use in the developing world and that appropriate outcomes are made available to departments such as DFID for wider dissemination. As a matter of policy we actively encourage all our research contractors to publish in readily available scientific publications the outcome of Defra funded research. In addition we make all research outcomes available to a wide audience on the Defra web site.

Defra is the sponsor (£25 million grant in aid 2003–04) of the Royal Botanic Gardens, Kew. Kew, which received UNESCO World Heritage Site status in July 2003, is renowned for its global contribution to the protection, conservation and scientific exploration and investigation of all aspects of plant life. Much of this is aimed at the developing world that is rich in plant genetic resources. Appointments to the Board of Trustees are made by the Secretary of State. Defra officials are regularly in contact with Kew on its business plan and related objectives and the Department is therefore influential in ensuring that research outcomes are, where possible, appropriate to developing countries and made readily available to them. For example Kew has recently compiled a compendium of information on the functioning of the Convention of Biological Diversity (Defra is the lead UK Government Department) which has been widely distributed to developing countries in three languages, on CD rom and is available on the Kew web site. Kew officials are often represented on Defra led delegations to international meetings.

Defra is the major subscriber (£235,000 pa) to CAB International, based in the UK. CABI has a major scientific and technical agriculture and food programme aimed at alleviating poverty and encouraging sustainability in developing countries.

Defra also takes the lead, assisted by CABI, in OECD's Task Force on Biological Resource Centres which is now in the third phase of developing accreditation standards for a world network of BRCs. This is aimed at enhancing the capacity of all countries, but in particular developing ones to conserve and exploit genetic resources.

*B. What input does DfiD have in the Department's work in developing policy on sustainable development?*

There is a regular dialogue between officials of the two Departments on a wide range of issues including the development of policies relating to sustainability domestically and regionally. When appropriate, DFID officials join Defra led delegations to international meetings. Specific sustainability aspects of biodiversity can also be addressed in the inter-departmental Ministerial Group referred to below.

*C. How is the work of Defra and DfiD biodiversity policy co-ordinated?*

An inter-departmental Ministerial Group on Biodiversity has recently been established with Ministers from Defra, DFID and FCO as core members to deal with cross-cutting international biodiversity issues. This group will also oversee implementation of Defra's WSSD delivery plan on international biodiversity.

Officials from Defra and DFID consult each other on a regular basis. DFID are represented on official level international biodiversity group. The terms of reference of this Group include co-ordinating policy for international biodiversity conventions on cross-cutting issues. DFID officials are also represented on the delegations to the main international biodiversity conventions.

*D. What steps are taken by Defra to co-ordinate policy with DfiD to achieve a balance between support for addressing global environmental issues in developing countries, against pressing local issues such as water pollution?*

As mentioned above, Defra and DFID maintain inter-active contact at both Ministerial and official levels on a wide range of issues. The objective is to ensure joined up Government and help address this type issue. Such an approach to potential conflicts between the local requirements of developing countries and the wider global commitments and policies of the United Kingdom and the European Community requires a comprehensive understanding of the issues and a sympathetic approach to their resolution. Our contacts with DFID are designed to achieve this objective.

E. Does Defra's support for the Hadley Centre include any specific objectives to undertake climate-related research in developing countries? Are there any specific objectives to assist in building the capacity of developing country climate scientists, eg through the visiting scientists scheme?

Defra's Climate Prediction Programme contract with the Met Office Hadley Centre includes the requirement to build capacity in developing countries so that they can generate their own predictions of climate change over their country. The Hadley Centre has developed a regional climate model, PRECIS, which has already been supplied, along with training on its use, to a number of developing countries in Africa, Asia, Central America and the Caribbean, and is already being run for example in Cape Town, Havana, Mexico, Niger, and in the Caribbean Climate Programme. Training of scientists from Niger, Algeria, South Africa and China has been carried out through the Visiting Scientists Scheme at the Met Office, and PCs have been supplied to the modelling centre at Niamey, Niger. PRECIS has also been used in Pune, India, to develop climate scenarios for a Defra funded project on the impacts of climate change in India, and in Beijing, as part of a Defra funded project on the effects of climate change on Chinese agriculture. Future plans include training courses in 2004 in Bhutan (for Bhutan, Sri Lanka, India, Pakistan and Bangladesh) and Sao Paulo (for South American countries), with funding from the FCO Global Opportunities Fund. Other regions will be covered in 2005 and later.

F. Does Defra provide any support for developing country delegates to attend international negotiations and subsidiary scientific meetings on climate change?

Defra contributes an annual voluntary contribution towards the UNFCCC Trust Fund for Developing Country Participation. The Fund is used to ensure that delegates from all Parties to the Convention, including those from least developed countries and small island developing states are able to attend and participate in the Convention process. Defra has contributed £100,000 towards the fund for the 2004 calendar year.

IPCC activities, in particular the participation of developing country experts in the IPCC work, and publication/translation of IPCC material, are supported by the IPCC Trust Fund. Defra also gives annual voluntary contributions and for 2004, Defra contributed 250,000 Swiss Francs (approximately £109,000). In addition to cash contributions to the IPCC Trust Fund governments and participating organisations provide substantial in kind support for activities of the IPCC, in particular through hosting Technical Support Units, supporting the participation of experts in IPCC activities, translation and publication, and through organising meetings. The UK has also volunteered to fund costs for scientists from developing countries to take part in meetings connected with the Brazilian proposal.

April 2004

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## APPENDIX 78

### Centre for Land Use and Water Resources Research, University of Newcastle upon Tyne

The Centre for Land Use and Water Resources Research has carried out land and water related research in all regions of the world for DFID, World Bank, FAO, CGIAR and other development organisations.

We wish to comment on two specific points raised by the Science and Technology Committee Inquiry which relate to CLUWRR's area of expertise:

#### 1. THE MEANS BY WHICH DFID ACQUIRES AND USES SCIENTIFIC ADVICE IN DEVELOPING AND IMPLEMENTING ITS POLICIES AND PROGRAMMES

##### *Problems*

1.1 During the last decade, we have observed that there may be little congruency between DFID (and also other donor funded) Country programmes, in the way that programmes are designed and implemented, and the scientific advice and research findings available from DFID centrally funded (and other) research projects. Although DFID technical advisors have provided good support to research projects and to the dissemination of substantiated research findings, there is often a considerable time lag before relevant changes are seen in DFID-supported programmes.

1.2 A particular example of this is in relation to DFID supported rural livelihood, watershed development and forestry projects in India in Karnataka, Andhra Pradesh, Madhya Pradesh, and Orissa where, primarily through a lack of awareness of the water resource constraints and their developmental implications, project interventions are being implemented which may be having perverse outcomes. Rather than benefiting the poor and improving sustainable access to water resources the opposite may often be the case (see also the attached document which outlines in more detail the background to these concerns and calls for a review of current projects). It is believed that approximately 1 billion pounds will be spent by the Government of India under its 25 year perspective plan and perhaps a tenth of that by DFID in support of

these development projects—projects which are often being implemented in ignorance of current research evidence which questions the sustainability of these watershed interventions (although it is recognised that some DFID technical advisers are striving to introduce a more evidence based approach).

1.3 The shift within DFID to direct budgetary support to countries (and individual focus States in India) is diminishing the donor agency's ability to provide direct technical guidance to development projects. Particularly in countries such as India and China where donor contributions to development projects are a small proportion of the total costs, the technical "leverage" is small and the ability to redesign programmes as new scientific information becomes available through the donor's own centrally-funded strategic research programmes is lessened.

#### *Solutions*

1.1 The restructuring that is taking place within DFID HQ may provide the opportunity for better alignment of DFID central and country development efforts especially if the reformed Policy Division is able to encourage country programmes to take more rapid account of centrally funded research findings.

1.2 There is a need for DFID to rethink its strategy in relation to direct budgetary support and to produce a "road map" showing how it expects to promote relevant findings from its centrally-funded strategic research programmes and how it is introducing checks and conditions into countries and States which it aids through programme budgetary support.

1.3 A sustained and long term effort is required to better connect current research findings with land and water policymaking, particularly where outcomes from research contradict established positions in both the donor agency and the partner countries. Overcoming "myth-based" policies often involves tackling strong emotional and cultural attachments which may have been built up over many decades (or even centuries). A successful realignment of watershed policies in the DFID focus States in India should also be replicable in non-focus States (and in other countries such as China applying similar watershed policies) with the opportunity of making more effective use of development funds and influencing for the better the livelihoods of hundreds of millions of the poor, particularly the rural poor.

## 2. THE PROGRESS OF UK EFFORTS TO BUILD SCIENTIFIC, TECHNOLOGICAL AND ENGINEERING CAPACITY IN DEVELOPING COUNTRIES

#### *Problems*

2.1 There is some danger of a mindset developing within parts of donor agencies that all research that needs to be done in relation to natural resources management has already been done. The reality is that the very rapid social, institutional and environmental changes that are happening in developing countries continuously raise new issues (such as those mentioned above) which require a capacity for quick and effective response. (Another example from India, and one that is partly due to unregulated depletion of water tables, is that fluoride contamination of groundwater is becoming an issue of similar importance to the more widely recognised risks imposed by arsenic.)

#### *Solutions*

2.1 In relation to issues similar to those discussed above, and those relating to land and water resource management generally, we believe that DFID could achieve very considerable capacity building and knowledge generation benefits in developing countries. This could be achieved through supporting a centrally-funded research effort to assist with the development of more evidence based watershed development policies and to provide inter-country coordination and lesson-learning. This research and networking would aim to better connect science findings with policymakers, share policy development and implementation experiences between countries, raise awareness on land and water issues and allow sharing of technologies for supporting development planning. As many research organisations in the UK already have good links with counterpart organisations in India and as water-related networks already exist, there is an excellent opportunity to build on initiatives that have already been funded by DFID albeit, in most cases, with relatively short-term objectives in mind.

2.2 Although most development aid is rightly concentrated on supporting tactical actions on the ground to reduce poverty there is also a need to support more strategic and long term actions. Support from DFID central science funds can empower researchers in developing countries who may be then able to raise the within country level of knowledge applied to the solution of development problems. By nurturing key groups of researchers with independent funding and providing them with the opportunity to interact with external expertise, engage with policy issues and become active agents of change in their societies, DFID can exploit another opportunity for securing long term and pro-poor policy outcomes.

2.3 To engage in debates with overseas government and donor organisations in developing countries and shape strategies which involve the "connection" of science with policy and other aspects of governance is generally a very time consuming and long term activity. Furthermore it is not generally recognised as an important or a "research" activity by the Universities or for that matter by DFID. This needs to be better



recognised by both DFID and the Universities and mechanisms put in place to ensure that this service and research support can be provided to enable maximum benefit, and policy benefit, to be obtained from government and DFID funded research.

April 2004

Annex 1

PROPOSAL FOR A REVIEW OF WATERSHED DEVELOPMENT AND RURAL LIVELIHOOD PROJECTS—IS THE WEIGHT OF EVIDENCE GENERATED FROM A DECADE OF RESEARCH BEING IGNORED?

PROBLEM STATEMENT

In recent years, programmes promoting soil water conservation measures, forestry and groundwater-based irrigation have been extremely successful in many semi-arid areas of India and elsewhere in the world. Agricultural production has increased and the livelihoods of large numbers of people have been enhanced. However, this success has not come without a cost.

Watershed and rural development projects in India and elsewhere in the world, which have been implemented without due regard to water resource constraints have often resulted in failure to meet environmental sustainability criteria and failure to deliver the expected benefits to the rural poor. It is also believed that these projects may also be contributing to inter-sectoral, water and energy, resource conflicts: in some southern Indian States as much as two thirds of all the electricity generated is being used for pumping groundwater for irrigation purposes.

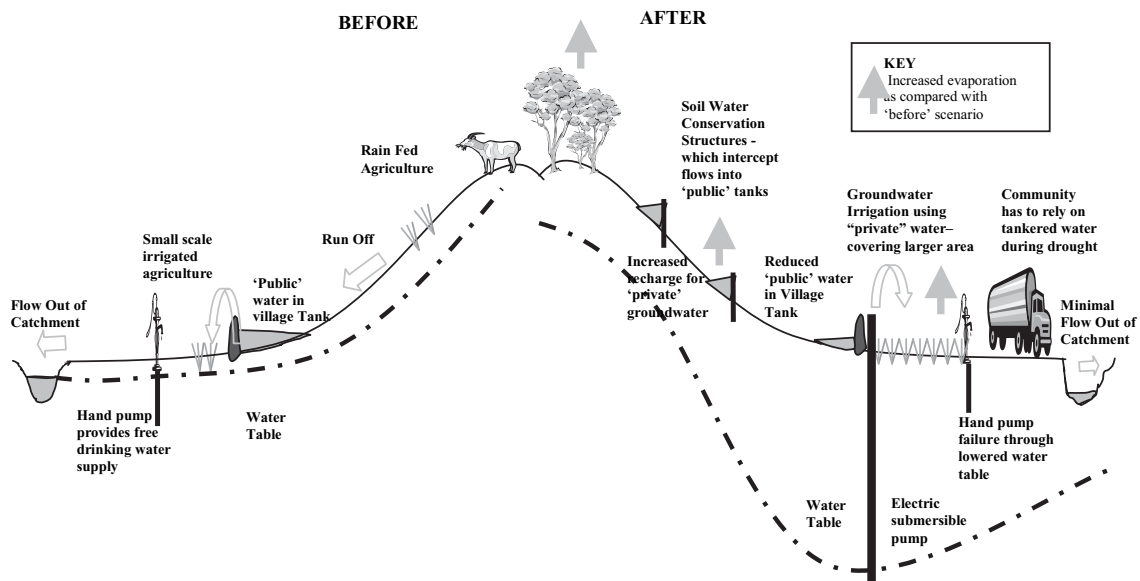


Figure 1

**Impact of catchment interventions on water flows and availability of “private” and “public” water.**

The promotion of forestry, irrigation and soil water conservation measures, particularly in catchments which are approaching closure,<sup>112</sup> has often had the perverse and inequitable effect of reducing the availability of “public” water in communal village tanks yet increasing the “private” water available for “private” use of the privileged farmers with access to deep groundwater resources. The promotion of irrigation that involves mining groundwater resources and substantial lowering of water tables is unsustainable in the long term, leads to “boom” and “bust” cycles in agricultural production, and incurs huge costs in terms of electric power generation for pumping groundwater from greater depths.

It is believed that a “sanctioned discourse” is developing within government and donor circles which is leading to watershed activities, such as forestry and watershed development, being promoted as benign technologies that are at the very least “poverty” neutral. If this discourse, based often on water-related myths (see Box 1), persists it may lead to a self-reinforcing tendency, between government and donor agencies, to

<sup>112</sup> Closure occurs in a catchment when supply equates to demand (ie when all available water resources are fully allocated). Initially, this will only occur in “dry” years but if demand continues to outstrip supply, closure will also occur in average and “wet” years.

disregard information and arguments that contradict the received wisdom as to the best solutions to water-related problems for the poor. There is evidence to indicate that the “sanctioned discourse” is pursued even when circumstances change radically, as happens when a region moves from water surplus into water deficit. In water deficit conditions there is overwhelming evidence to show that many present water-related policies and practices are doing little to benefit the poor and little to achieve the relevant Millennium Development Goals.

#### WATER-RELATED MYTHS

- Water harvesting is a totally benign technology.
- Planting trees increases local rainfall and runoff.
- Runoff in semi-arid areas is 30-40% of annual rainfall.
- Rainfall has decreased in recent years.
- Aquifers once depleted stay depleted.
- Watershed development programmes droughtproof villages and protect village water supplies.
- Introduction of drip and sprinkler irrigation frees up water for other uses.

#### PROPOSAL

A project is proposed with two phases. In the scoping and diagnostic phase (1) a review will be undertaken to evaluate a) the extent and magnitude of (and prioritise) the environmental sustainability and poverty targeting problems which may exist with ongoing and planned DFID and World Bank funded water-related development projects and b) whether existing planning procedures are taking proper account of the current state of knowledge of how interventions involving forestry, irrigation and increased implementation of soil water conservation measures affect the poor (and if not, how this can be rectified). An implementation and support phase (2) will focus on priority projects which have earlier been identified with a view to c) recommending, and where necessary developing, planning and monitoring methodologies which take proper account of water resource constraints, and d) recommending, and where necessary developing, planning and monitoring methodologies to take proper account of project impacts on the poor.

The focus of the work will be in India. Additional evaluations will also be carried out in other countries where there are current concerns about the environmental sustainability and poverty impacts of water-related development projects. These countries will include the extended FRP FLOWS network of countries: China, South Africa, Tanzania, Ethiopia and Panama.

The project will build on the outputs of the forest and low flows project (R8171) funded by the DFID Forestry Research Programme and fits well with the spirit and intentions of the DFID India Country Plan and the DFID Water Action plan particularly in relation to “more integrated approaches to tackling poverty in focus states” in India and improving the enabling environment for sustainable and equitable growth”.

#### OUTPUTS

It is proposed that outputs will be in the form of quarterly and a final report to DFID and the World Bank with dissemination workshops to be held with DFID London, DFID India in Delhi and the World Bank in Washington, in either Water or Environment Week in 2005–06.

The scoping study report of Phase 1 will:

- Evaluate the extent to which ongoing and planned DFID and World Bank funded (and where appropriate within-country funded) water-related development projects are achieving pro-poor and environmental sustainability outcomes.
- Evaluate the extent to which both donor and local government decision-making is based on a “sanctioned discourse” that overlooks research information and information collected by government line departments and agencies.
- Provide a “first cut” evaluation of the socially disaggregated “winners” and “losers” from water-related development projects.
- Make recommendations for practical changes that could be made to ongoing and planned projects that will improve the potential for environmental sustainability, improved pro-poor outcomes and better targeting of donor funding.
- Produce a range of awareness raising materials in a range of formats.

The project will be co-ordinated by the Centre for Land Use and Water Resources Research with Charles Batchelor, Ian Calder, Ashvin Gosain and others as principal investigators who will involve relevant counterparts and networks in the study areas.

ROOT OF THE WATER PROBLEM (LETTER SUBMITTED AND PUBLISHED IN THE  
*GUARDIAN*, THURSDAY 4 SEPTEMBER 2003)

IAN CALDER, DIRECTOR, CENTRE FOR LAND USE AND WATER RESOURCES RESEARCH

John Vidal's article in the water section of the Saturday 23 August *Guardian* raises questions the West must answer to address the World's water problems.

One of the solutions put forward "If we learned not to cut down forests, we'd find that there was more water for everyone" illustrates a widely held misconception about the roles of forests as they affect the water regime. It is one that is arguably leading to the wastage of billions of dollars of development funds by aid organisations on afforestation programmes, particularly in Asia and Latin America, in the mistaken belief that they will benefit water resources.

Hydrological studies worldwide show that forests with very few exceptions (possibly cloud forests and some that are very old), whether indigenous or plantation, will evaporate significantly more water than shorter vegetation types and reduce water available for the recharge of aquifers or for supplying water to rivers.

In some countries such as South Africa, which has a well established scientific tradition of employing catchment studies to investigate how land use alters the water regime, the true role of forests in relation to water is well understood. The South African Water Act, rather than promoting forests as a means to improve water resources recognises the true impacts and imposes effectively a "Stream Flow Reduction Activities" tax on landowners of high water consuming land uses such as plantation forestry and sugar cane.

In the UK, highlighted in the *Guardian* article as one of the most water stressed countries in Europe, the impacts of forests on water resources are also becoming better understood and accepted. As a result of extensive and detailed past hydrological studies, both water and forestry interests now accept that upland coniferous afforestation will reduce annual stream flows by typically 20%. In the lowlands of England a lesser number of studies have yielded inconclusive results but recent studies at Sherwood Forest, conducted by Newcastle and Loughborough Universities and the Forestry Commission (funded by DEFRA), indicate in percentage terms much greater impacts. As compared with grassland, oak forest will reduce long term recharge by about 50% and pine forest will reduce it by about 75%. Furthermore, under pines essentially no recharge will take place in a year of average rainfall. Only in a year of high rainfall such as 2000, will the "water pulse" pass through the root zone of the trees and reach the aquifer.

A cluster of projects funded by the Department for International Development's Forestry Research Programme (FRP) is investigating the true nature of the role of forests on the water environment in different parts of the world, with partners in South Africa, Tanzania, Grenada, India and Costa Rica, and is taking steps to ensure that this collective scientific knowledge is better connected to the policy making process. The aim is to assist the creation of truly science based, rather than myth based, land and water policies. Whilst there may be many reasons to promote forests on the basis of their production, conservation, amenity, recreational and other environmental benefits these need to be considered in relation to the generally adverse effects on water resources.

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APPENDIX 79

**Memorandum from Dr Andrew Cotton, WELL Resource Centre, Water, Engineering Development Centre, Loughborough University**

Dr Andrew Cotton is a Public Health Engineer with 25 years experience in international development work in water, sanitation and urban upgrading. He works at the Water, Engineering and Development Centre (WEDC) at Loughborough University where he is Director of DFID's Resource Centre in Water, Sanitation and Environmental Health (known as WELL).

CONTEXT: MILLENNIUM DEVELOPMENT GOALS AND ASSOCIATED TARGETS

1. There is a strong focus at the global level on the Millennium Development Goals (MDGs) and their associated targets. The prime focus is around poverty reduction and the UK government position is clearly aligned with this; it has been at the fore in developing the agenda. This provides the context for considering the contribution of engineering and technology. There is a strong degree of inter-relation between the MDGs and water and sanitation contribute to most of the goals. Because neither water nor sanitation are headline goals, there needs to be a strong advocacy effort for the contribution the sector makes—and, by implication, the role of technology.

#### ACQUIRING AND USING ADVICE IN POLICIES AND PROGRAMMES

2. It is crucial to state at the outset that the key development issues in water and sanitation are not primarily technological, although technology is an essential part of the overall picture (and not all technology problems have been solved). This includes: institutional, financial, economic, health, social context and environment. Nevertheless, there has been a detectable reduction in the emphasis placed by DFID on the role of technology and engineering as a means to support pro-poor development.

3. To take the case of water supply and sanitation, we have seen this through reduced demand for advisory and policy development services, both to the DFID centre and its country programmes, through DFID Resource Centres over the last five years. This needs to be set alongside the international commitment to the Millennium Development Goals (MDGs) and their associated targets. The UK government through DFID was a prime mover behind one of the great achievements at the World Summit on Sustainable Development in Johannesburg 2002, namely adopting a global target for improving access to sanitation. This is reflected in the global headline figures: 1.2 billion lack access to safe water and 2.4 billion lack access to adequate sanitation. The level of interest of the British public in water and sanitation can be partly gauged through looking at donations to key charities: for example, WaterAid's income increased by 50% to £17 million over 2002. The British public and corporate sector see water and sanitation as a good thing to be doing.

4. On the positive side, the development of DFID's strategy paper on Water (DFID, 2001) used the evidence base of their research and involved a range of stakeholders including the research community. The problem appears to have been converting this into commitments in the country programmes.

5. It can be difficult for an outsider to see how the current structure in DFID policy division is able to take on board science and technology issues in the broadest sense, or how this structure and the advice it generates can feed through to the institutional and governmental structures at national level in developing countries, which tend to operate on the basis of sectoral ministries, as does the UK.

6. There may be an internal capacity issue here: put crudely, if you do not have sufficient of the right people on the ground in the right place to ask the right questions—or in the position to ask the right questions—then the potential contribution of technological improvements (whether direct or through development of national capacity to deliver) is unlikely to feed through into programmes and strategies in a structured way. Environmental health, which accounts for 21% of the burden of disease worldwide, provides an example of this. DFID's programmes are largely decentralised to the country level; a useful indicator might be to establish the coverage of engineering advisory capacity in country offices in relation to other disciplines such as economics, social science and governance.

#### INVESTMENT IN RESEARCH AND DFID COUNTRY PROGRAMMES

7. DFID operated a well-regarded technology-related research programme through the Engineering Knowledge and Research programme (KaR). This programme was competitively bid and gave rise to good interdisciplinary research on highly relevant topics. There was a real understanding on the part of those commissioning the research about the place of technology and engineering within a broader development framework; that is the particular institutional, economic and social contexts. Although the programme had a technology label, it had to be interdisciplinary, bringing engineers together with social scientists and economists. There was a sense that the engineers within DFID went out of their way to ensure that other disciplines had a significant role in contractors' research teams. It is less clear to what extent the reverse occurred ie did other disciplinary groups within DFID require engineering inputs to their research programmes? It is to be hoped that the new central research strategy will ensure that such interdisciplinary links are forged.

8. The scale of the research programme, which had a large number of projects, meant that it was difficult for DFID advisers to engage directly with the research process; important components such as research reviews were outsourced. In such situations there needs to be a careful dissemination strategy to ensure consolidation of research findings so that advisers have ready access to key findings.

9. It is not clear how the outputs of research (for example KaR) feed into the process of country strategy and action plans. Even though in an overall sense DFID may view its research efforts as contributing to the global good, one would expect to see good links to country programmes. The links between research, central and regional policy development and country programmes have been weak and it is not clear that improving this is on anyone's agenda.

10. It is easy for researchers to set all of the blame at DFID's door (and there is a degree of bleating about this); however, part of the problem lies with researchers themselves who traditionally feel that they have a responsibility to do good science/engineering/technology research, but that is where their input finishes. The researcher often assumes that it is someone else's problem to take their outputs forwards and this defaults on to the client for the research. There is a need to build in much longer post project phases for dissemination, "versioning" of findings into new formats such as short policy briefs, looking at target audiences and writing specifically for them. In other words there is a need to work really hard on getting uptake into policy and programmes in specific countries and there needs to be a recognition of shared responsibility for this.

11. This requires a broad and strategic commitment to dissemination and uptake which has often been lacking in some research programmes. Again, it is to be hoped that the central research strategy will take on board the best practice (both internal and external to DFID) to promote improved dissemination and uptake.

12. In terms of the use of technology research in international development there is need to distinguish between research in new technologies and applying existing ones. For example, with respect to improving basic services for the poor in water and sanitation there is a large output of research findings—this also applies to other sectors such as transport and energy. The primary research need here is to obtain a sound evidence base on what works and what doesn't in particular contexts; until that is better understood, it seems relatively futile to invest heavily in new technology work in these areas. The need is to focus on the "development" component of "research and development". The point is that this work needs to be done and the research programmes need to offer a mechanism for this.

#### EXTENT OF ENGINEERING TRAINING AS PART OF DEVELOPMENT POLICY

13. There are serious capacity development constraints at several levels, certainly in respect of water and sanitation, and also much more generally:

14. University and tertiary education. At risk of generalising, there are difficulties with engineering curricula in developing country universities that, in the case of water and sanitation, tend to be inappropriate for the local circumstances. A key area for future work is to develop more appropriate curricula that are appropriate, fit-for-purpose and recognised as being first rate. There is an opportunity to link with professional associations and institutions. There is a tendency to view non-high tech solutions as second best. This is not true; the basis of engineering planning and design is what works best in a particular context; you cannot take blue print solutions and apply the one-size-fits-all principle—and the same applies to so-called appropriate technology solutions. The change is long term, but it is the next generation of engineers who will have real influence on national level implementation of improved service delivery for the poor. The solutions need to be rooted in local society and its economic and social needs.

15. Local resource centres. There is a lack of capacity to develop and apply appropriate solutions and this is where local sector-based resource centres have an important role at regional, national and sub national levels. Very often, the solutions to, say, "75% of the problem" are available locally. The capacity issues are around picking these up, disseminating, transferring knowledge and working out how to modify and apply the solutions in particular institutional and social contexts. This requires a particular type of capacity to be developed; it is a research and development capacity—which is not necessarily the PhD but can be provided through local and regional resource centres and universities. In water and sanitation, the development and support to sector resource centres to enable them to attract business and function as financially viable entities is crucial to achieving national water and sanitation targets. National, regional and global capacity is very limited.

16. Overall the commitment of DFID to training and capacity building in engineering and technology seems to have reduced over 20 years. There appear to be a number of difficulties, but also opportunities.

- One of the most positive aspects of the Engineering KaR programme was the insistence on working fully with local research partners. However, the assumption was that involving partners in the research was also serving the purpose of local capacity building for research. Whilst there is an important element of capacity building this was not based on needs analysis in any formal sense. The lesson is that research programmes can provide a good vehicle on the back of which capacity building can take place. The time has come to take capacity building seriously and not assume that it is either (a) a bolt-on activity (b) somehow rubs off from one person to another or (c) comprises nothing more than one-off training courses. It is a central constraint to achieving the MDGs.
- Working with southern partners needs to extend into setting the research agenda, focusing much more on end users and extending the ideas of two-way learning to wider knowledge networks.
- Cut backs in DFID funding of formal training on Master programmes has had a number of longer term effects. For example, in the 1980s Malawi had three Chief Engineers responsible for water and sanitation for the whole country. All had been trained on the WEDC Masters programme at Loughborough University and subsequently been promoted to these high positions. These people develop strategy and implement programmes for better service delivery to the poor, so we had the potential for real development influence on the lives of poor people which has now lost support. Other former Masters students return on visits to UK in order to procure goods and services for their country, having been exposed to UK engineering practice on their Masters programme. This is not to advocate a return to the past; many training providers now offer a range of delivery methods including distance learning programmes. The educational aspect of science and technology in development merits much more serious consideration than it has received of late.
- An interesting downside to the very welcome increase in budget for the UK Aid Programme is that some key capacity building activities may be lost because the budgets are too small to warrant the effort of administration.

17. It is time to take a long term view, to understand that it is not just the quick fix project based training that can have influence; rather, the longer term approach eg through developing improved curricula, supporting local resource centres, bringing people on to Masters programmes which are very focused on doing the job better, can have real development outcome and impact.

May 2004

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## APPENDIX 80

### Memorandum from Glasgow Caledonian University

There are three possible positions on collaboration between the North and South to develop science capacity to drive socio-economic development in the South.

1. The first model is for “big” science in the North to do research to solve the major problems in the South. The problems would be ones identified by countries in the South but the research would be done by scientists in the North with the possibility of involvement by scientists from the South in research teams. This research might usefully be focused on HIV/AIDS, maternal health and agriculture. This model will do little in the short or medium term to develop science capacity in the South.

2. The second model is about building science capacity in the South by providing training for outstanding young scientists who in time will become the leaders of research teams carrying out “big” science research that is recognised as equal to the leading research in the North. This is long term and will only build the capacity of a group of elite researchers. They can probably be funded to carry out research relevant to their region and they may stay in the South but neither is guaranteed.

3. The third model is about building the capacity in the South in technology, science and management to enable research, development and knowledge transfer to underpin the realisation of governments’ own Visions and the Millennium Development Goals. It is about training and educating local staff so that they can carry out applied research, development and knowledge transfer. It is about building the capacity of institutions of higher education to deliver to international standards higher education, research and knowledge transfer to meet the needs of their country. It is about meeting the immediate needs of countries and their populations not by investing in “big” science but in investing in research, development and knowledge transfer that will enable the provision of light, energy, safe water, improved communication systems, diversification from reliance on farming and so on. It is less dramatic than the second model but this model is not only likely to be an investment in capacity building that will become embedded but also to begin to have an impact in improving the lives of ordinary citizens very quickly. Also staff and students trained and educated under the third model are much less likely than those whose capacity is built by the second model to move to jobs in the North. They will not have the same credentials and their education will have been directed at equipping them to work in their own country.

4. The proposal for funding to build science capacity developed by Glasgow Caledonian University and the Kigali Institute for Science, Technology and Management (KIST), Rwanda is built on this third model. It builds on the development needs identified by the Rwandan Government and KIST and on the existing collaboration between the two institutions. It is informed by the work that GCU has undertaken working in a number of countries to develop the nursing curriculum. Modern universities such as Glasgow Caledonian are well placed to collaborate with higher education institutions in the South building science capacity because they have built their applied research capacity up over a considerable number of years and are focused on graduating students to meet the needs of employers.

May 2004

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## APPENDIX 81

### Memorandum from the Centre for Tropical Veterinary Medicine, University of Edinburgh

TROPICAL ANIMAL HEALTH RESEARCH AND INTERNATIONAL DEVELOPMENT

#### *Livestock and the poor*

Animal agriculture is a significant source of economic growth in developing countries: over 50% of the capital invested in agriculture in Africa is in the form of livestock. Livestock are particularly important to poor people. It is estimated that over 70% of rural people who live on a US\$1 per day or less—over half a billion poor people—derive a significant proportion of their income and livelihood from livestock. Livestock support the livelihoods of poor people in many ways:

- They produce high-value products (milk, meat, eggs) that provide income to meet education and (human) health expenses;

- They are an important means of savings and investment, which can be used as buffer for crop failures and other unforeseen expenses.
- They are a means of transport and traction, and provide fertiliser and fuel.
- Unlike many other agricultural activities, there are few social taboos associated with livestock keeping. This means that in most societies women are allowed to rear animals, and (more importantly) to keep the money they make from their livestock.
- Livestock can graze on common land—making livestock keeping particularly important to poor people who are landless.

Livestock production is especially attractive to poor people, many of whom consider livestock enterprises as the best option for escaping poverty. Livestock are the most popular form of investment for people (especially women) who participate in credit programmes, and are widely favoured by NGOs as a means of reducing poverty.

#### *Impact of research on poverty and hunger*

“*The Slow Magic of Research*” In a recent analysis of the potential for eliminating hunger, Runge et al.<sup>1</sup> discuss the ways in which research can contribute. Entitled “*The Slow Magic of Research*”, they make a number of key points which should underpin any consideration of research impact. The first is that time-lags are an inevitable part of the process. The lag between a research breakthrough and widespread impact can easily stretch to several decades.

“Lags between investing in research and reaping some return . . . are an important reason why there is underinvestment in research. Even the most public-spirited politicians see less benefit in supporting research that develops a new crop variety in seven years than in subsidizing farmers directly today.”<sup>113</sup>

Costs are heavy initially, tend to rise somewhat as a subject gathers momentum, and then tail off as research effort becomes mainly geared to promoting adoption and uptake. Benefits start to flow only when the bulk of the research has been done, with slow uptake initially usually proceeding in stepwise increases as the research product is taken up by new groups of end-users. For much research, benefits then tail off as the research product is superseded by other innovations, production systems change and new solutions are required. Crop pests and diseases, for example, may evolve to overcome the resistance bred into new crop varieties. In the livestock sector, some animal health problems may become less relevant and others more so, as production methods become more intensive and new diseases emerge.

However, the benefits of research on diseases do not necessarily tail off in this way: in the fields of both human and animal health there are instances where research benefits continue to be high over a very long period. This happens when a long-lasting solution, often a vaccine, makes it possible to control sustainably, or occasionally even to eradicate, a disease which would otherwise have continued to pose a severe threat to human and/or livestock populations. For example, Edward Jenner produced his vaccine for smallpox in 1796; the World Health Organization (WHO) declared the disease was eradicated 184 years later. This lag between the bulk of research expenditure and the realisation of benefits is a major disincentive to investment in research and is behind the oft-repeated phrase that research “doesn’t pay”.

A second factor is the inherent riskiness of research. Within any research portfolio, some projects will “succeed” in producing results or developing approaches that can be adopted by target groups and eventually taken up by many end-users. Others will “fail” in the sense that, while the planned work is done, it does not lead to the hoped for breakthroughs or improvements in living or working conditions for end-users.

“Part of the reason for the large variation in the returns to research is that eventual outcomes are highly uncertain. For many projects costs of research exceed the benefits. But other research is highly successful, leading to very large benefits compared to costs. This variation is an additional strike against any individual line of research . . . Despite these risks, on average the rates of return to research have not declined over time.”<sup>113</sup>

In general, though not invariably, riskiness increases the further upstream the research, and decreases where adaptive research is clearly geared to certain locations and production processes. But for both types of research, those commissioning it must accept that not all projects will be successful. From those that are successful, however, the benefits will often outweigh the costs of the entire research portfolio. For example, the review of DFID funded livestock projects undertaken in 2005 indicated that the benefits gained from work on sleeping sickness in Uganda easily exceeded total DFID expenditure on livestock research throughout the previous decade.<sup>114</sup>

<sup>113</sup> Ending Hunger in our Lifetime (Runge et al., 2003).

<sup>114</sup> Landell Mills (2000). Evaluation of Selected Livestock Research Themes. Report prepared for DFID. Landell Mills Ltd, Trowbridge, Wiltshire, UK. 119 pp.

Recent studies have shown that, despite time-lags and riskiness, the returns to agricultural research are good. Alston *et al* three analysed the returns to research in 12 agricultural commodity groups; the returns to livestock research were more than 50% higher than the figure for “all agriculture”, and were only just outranked by maize research. Livestock research is thus shown to be particularly profitable. However, Rudge *et al*<sup>115</sup> point out that, for a variety of reasons, returns in developing countries are not as high as in developed countries, a factor that again accentuates the gap between North and South.

#### *Tropical animal health R & D*

Animal diseases are a major threat to poor livestock-keepers and are often considered by poor people to be one of the most important constraints to improving livelihoods. In areas with weak veterinary support, as much as 25% of herds/flocks are lost to disease each year. These losses can amount to between US\$120 to US\$180 annum per farmer—a significant amount for those living on US\$1 to US\$2 a day.<sup>115</sup>

Animal disease also has a major direct impact on human health. Many animal diseases are *zoonotic*: diseases such as brucellosis, Rift Valley fever, tuberculosis and trypanosomiasis can add to the health problems of poor people, particularly those with HIV/AIDS. However, vaccines and therapeutics against many of the common diseases that inflict the species owned by poor people are either lacking, or not available in a form that is appropriate for use by a lay-person in a developing-country village setting. The relatively paucity of veterinary medicines for tropical livestock diseases is a reflection of global market forces that favour high-value OECD markets in human health and companion animals. Few new veterinary products have been developed for diseases of economic importance only (or primarily) in developing countries in the last 30 years simply due to lack of interest in the market:

“Total global private sector investment in animal health R & D was about \$1.1 billion or 9% of sales in 2003. Investment in animal health R & D projects targeted specifically at developing countries needs is not quantifiable, however, we expect these therapeutic sectors to be of very low commercial importance and therefore investment is expected to be minimal”.<sup>116</sup> In USA the main targets for this research were treatments for cancer, arthritis and heart disease in domestic pets and a vaccine for West Nile virus.<sup>117, 118</sup>

#### *Animal Health Research and DFID*

As a consequence of the minimal interest of the private sector, the public sector funds practically all research in tropical veterinary research which amounts to around \$52 million invested by eight donors.<sup>119</sup> DFID has funded tropical animal health research through its Animal Health Research Programme (AHP) since 1990 contributing around £2 million annually (total £29.3 million over 15 years). AHP is managed on behalf of DFID by the Centre for Tropical Veterinary Medicine of The University of Edinburgh.

The research priorities of AHP have been focussed by a study to quantify the extent of poverty in South-East Asia, Southern Asia and sub-Saharan Africa, its association with livestock keeping, determine which species were of importance to the poor and rank the disease constraints to these species and from this to identify research opportunities that will promote better donor coordination and impact on poverty alleviation.<sup>120</sup>

#### SUB-SAHARAN AFRICA: THE HUNGER “HOTSPOT”

Poverty and hunger are getting worse in Africa. Nearly half the population of sub-Saharan Africa is living below the international poverty line. During the 1990s, the proportion living in poverty remained unchanged, whilst the absolute numbers grew as populations grew. Child malnutrition too has grown, from 22 million in 1980 to 38 million children in 2000. Two countries, Nigeria and Ethiopia, accounted for about half of all the stunted children in Africa in 1995. Amongst the most food insecure are the refugees and displaced who are dependent on the international relief system for their needs.<sup>121</sup>

As a consequence of this study the bulk of AHP funded research (98%) is now concerned with the problems of livestock keepers in Africa; some 25% of the funding is focussed on poor livestock keepers in the Lake Victoria basin.

<sup>115</sup> Community Based Animal Health Workers. The IDL Group, 2003 (191 pages).

<sup>116</sup> Wood Mackenzie, Healthcare Consultants, Edinburgh.

<sup>117</sup> Animal Health Institute, Washington, Research and Development Survey, 2002.

<sup>118</sup> This may be compared with the \$22 billion spent annually on human health care R & D by the five largest private sector companies.

<sup>119</sup> This may be compared with the Global Fund to Fight AIDS, Tuberculosis and Malaria which has pledged totalling US\$ 5.0 billion.

<sup>120</sup> B D Perry, T F Randolph, J J McDermott, K R Sones and P K Thornton (2002) “Investing in animal health research to alleviate poverty” International Livestock Research Institute (ILRI) Nairobi, Kenya, 130 pp. plus annexes.

<sup>121</sup> DFID (2002) Eliminating Hunger—DFID food security strategy and priorities for action. Consultation Document.



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*Centre for Tropical Veterinary Medicine (CTVM)*

The Royal (Dick) School of Veterinary Studies started to teach tropical veterinary medicine as a specialist subject in 1930; the present Centre for Tropical Veterinary Medicine (CTVM) was opened in 1970 by the Duke of Edinburgh. CTVM is a unique institution in UK being devoted to tropical animal health. Other European countries continue to fund tropical centres of differing sizes mostly within the University structure but with varying degrees of governmental support (Germany (Berlin); Italy (Milan); Belgium (Antwerp); Portugal (Lisbon); Holland (Utrecht). France has a centre in Montpellier (IEMVT) wholly supported by the Government.

The primary aim of CTVM was to teach veterinarians both from home and overseas the basics of tropical medicine. Over time, the needs of students in the tropics have changed. Veterinary schools have been built in many countries in the tropics and the specialism of tropical veterinary medicine may now be taught in-country. However UK still has much to offer the developing world in cutting-edge science and Scotland in particular is especially well endowed with expertise in what may be seen as the golden triangle for parasitology research: Glasgow-Dundee-Edinburgh.

The aim of the CTVM now is to carry out research of international standing on diseases of the tropics and to train to the PhD level young research scientists, particularly veterinarians, from around the world in these disciplines.

CTVM has six academic staff, nine post-docs and 26 PhD students [from Kenya, Uganda, Tanzania, Zambia, South Africa, Algeria and China as well as from Europe (France, Spain, Italy, Greece) and UK]. All of these PhD studies have one aim in common—to improve the lot of poor livestock keepers beset by diseases, often vector borne, which are unique to the tropics.

Research at CTVM continues to be generously funded by the Department for International Development (DFID) through the AHP (Animal Health Research Programme) (around 20% of AHP resource directly funds projects in CTVM). The EU also provides funding for a limited number of research projects in tropical animal health (two research projects—from France and Holland—were funded in the last round in support of international cooperation INCO-DEV FP6). CTVM research is also funded by many charitable trusts including The Wellcome Trust and the Cunningham Trust. Indeed, to underline its continued commitment to research in this area, the Wellcome Trust has recently announced a special funding initiative for Animal Health in the Developing World.

Recently (November 2003) new laboratory facilities for molecular biology were opened at CTVM by the Father of the House, Tam Dalyell. Funding came from the Science Research Investment Fund (SRIF) which aims to enable scientists to continue to develop vital research in Scotland. SRIF funding, in part from the Government and part from the Wellcome Trust, is for investment in the long-term sustainability of research infrastructure. The University of Edinburgh received £27.8 million from the current SRIF round and gave £1.2 million to refurbish the laboratories at CTVM, reflecting the University's continued commitment to research in this field.

*UK Science and future of research in tropical veterinary medicine*

“As a new century begins . . . the South-North knowledge gap is widening . . . The pool of science and technologies that can spill over from rich to poor countries is growing more slowly. The slow-down in science spending in the developing world (especially Africa) also limits the capacity of poor countries to develop locally relevant technologies and tap into stocks of knowledge developed elsewhere.”<sup>3</sup>

Access to technology—the key to combating poverty: As globalisation has brought the world closer together, it has also sharpened differences, and this growing divergence is most noticeable in the area of technology. Jeffrey Sachs<sup>122</sup> sees today's world as divided by technology, not ideology. Nearly all of the world's technical innovations come from a small part of the globe, a further half of the world's population makes use of these technologies, and the remaining third are “technically disconnected, neither innovating at home, nor adopting foreign technologies”.

According to a recent report by the United Nations Development Programme (UNDP), the 29 industrial nations that make up the Organisation for Economic Co-operation and Development (OECD), with 19% of the world's population, accounted for 91% of the patents issued in 1998. That year, those countries spent \$520 billion on research and development (R&D)—more than the combined economic output of the world's 30 poorest countries.

Whilst elsewhere the pace of and level of investment in technical change is greater than ever before, “almost nothing is going into the problems that are strictly the problems of tropical societies” says Sachs. As the Government's White Paper on globalisation and poverty<sup>123</sup> states, “research that benefits the poor is an example of a global public good which is under-funded”.

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<sup>122</sup> The quotations used come from an article by Sachs entitled “A new map of the world”. *The Economist* 22 June 2000.

<sup>123</sup> “Eliminating World Poverty: Making Globalisation Work for the Poor” White Paper on International Development, December 2000.

Animal health straddles the agricultural and health sectors, sharing the problems faced by both. The financial incentive to develop drugs and vaccines for tropical diseases of livestock is very small, and within the under-funded agricultural sector, livestock is often the poor cousin. However, UK is a world leader in basic bio-medical research and this science can help address the “technology gap” which Sachs has identified.

The United States leads the world in the impact its research makes in almost every scientific domain, except in five areas: Pharmacology and pharmacy; Agriculture Veterinary science; Pure mathematics; Mineral and mining engineering.<sup>124</sup>

There is no shortage of animal disease problems in Africa<sup>120</sup> and the molecular sciences, in which UK excels,<sup>124</sup> now offer the promise of solutions to these problems which have constantly beset farmers in the tropics. However, such technical challenges require much greater inputs of both manpower and funding than previously been thought adequate. Our colleagues in human health research have set up huge collaborative networks to attack diseases such as TB and malaria. The problems faced in animal health in the tropics are no less technically daunting and risky but no less soluble.

DFID have responded positively to the technical and financial problems such research presents and intend to assist in establishing a public-private partnership specifically to develop vaccines against common livestock diseases of the tropics. UK laboratories, including CTVM will inevitably be involved. An example of the sort of effort required is the current project to develop of a vaccine for East Coast fever (theileriosis, a fatal disease in cattle) involving laboratories in Oxford, Edinburgh and Brussels working with the International Livestock Research Institute (part of the CGIAR system). As this is a protozoan disease, the technical obstacles are formidable (as with malaria vaccines) and will only be overcome by pooling technical resources and providing sustained funding. This project is being funded by DFID working together with the private sector (Merial and The Institute for Genomic Research (TIGR)).

We remain optimistic that UK science can work with DFID to achieve our goals in animal health given the correctly managed and sustainable resources.

June 2004

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## APPENDIX 82

### Memorandum from the Faculty of Science, Chancellor College, University of Malawi

The Faculty of Science has a total of seven departments namely Home Economics, Geography and Earth Science, Population Studies (newly formed), Biology, Chemistry, Physics and Mathematical Science. In addition the Faculty has one research centre, the Natural Resource and Environment Centre (NAREC).

The Faculty carries out important research that is aligned to the national Science and Technology Policy. It has a great opportunity to contribute to teaching and research (capacity building) in the fields of Applied Science, Environmental Education, Environment and Natural Resource Management. As explained by department profiles, the faculty offers courses and research that is relevant to improvement of people's livelihoods. This is seen through a number of previous, on-going and planned activities. Despite these efforts departments within the faculty face a number of challenges.

This brief outline expands on what was already submitted to DFID earlier on by the University Research Coordinator.

#### PREVIOUS ACTIVITIES THAT THE FACULTY OF SCIENCE IN GENERAL HAS BENEFITED FROM THE BRITISH GOVERNMENT

Links with other Universities—eg Universities of Wye, New Castle Upon Tyne, Stafford Sponsored by British Council

Human Capacity Development—The faculty acknowledges past assistance by the British Government where a number of staff were trained in UK under the British Council Scholarship.

#### LIMITATIONS TO DEVELOPMENT OF SCIENCE AND TECHNOLOGY

Despite initiatives by the faculty of science such as establishment of Natural Resources and Environment Centre and introduction of postgraduate programmes in the departments to advance S&T within the faculty, there are a number of limitations including:

Research Grants. The University no longer provides funds for research due to reduced government funding.

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<sup>124</sup> Benchmarking international research—Impact measures rebased against world baseline for 68 subjects. *Nature* 396, 615–618 1998.

<sup>120</sup> B D Perry, T F Randolph, J J McDermott, K R Sones and P K Thornton (2002) “Investing in animal health research to alleviate poverty” International Livestock Research Institute (ILRI) Nairobi, Kenya, 130 pp. plus annexes.

Inadequate Trained Human Resources. Training of members of staff up to PhD level is one of the priority areas for assistance if they are to effectively carry out their teaching and research duties in order to contribute more effectively to the improvement of people's lives. Technicians are not updated on use of new technologies. Very few academic staff have PhDs. Some members have stayed for over 10 years after obtaining their Masters and are still looking for PhD scholarships without success.

<i>Dept</i>	<i>PhD</i>		<i>Masters</i>		<i>Bachelor/Honors</i>	
	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>
Home Economics	2		2	2		1
Geog. and Earth Science		2	2	3		
Biology		3	3	4		
Chemistry	1	3		2		2
Mathematics	1	2	1	3		3
Physics		1		3		2
Total	4	11	8	17	0	8
	15		25		8	

#### *Infrastructure to support some faculty initiatives*

Limited funds do not permit expansion of appropriate infrastructure. For example for the NAREC, although drawings were done, the centre operates from one office room offered by the Biology Department and the Masters in Environmental Science from one office in the Mathematics Department. The postgraduate students are squeezed in one room in the Physics Department. The research centre does not have own labs, library, ITC offices and teaching rooms.

Maintenance and upgrading of equipment—Most equipment is outdated or not working.

#### POTENTIAL FOR ADVANCEMENT OF SCIENCE AND TECHNOLOGY

The faculty as can be appreciated from the visions and efforts of departments has great potential to contribute towards advancement of S & T.

It is hoped that with the creation of the new Ministry of Industry, Science and Technology, support for Science and Technology will be increased to the University.

#### 1. A BRIEF ON THE NATURAL RESOURCES AND ENVIRONMENT CENTRE

##### *Introduction*

Research centres enhance research capacity and respond to the needs of the nation in solving problems requiring expert analysis. These are also important for the generation of baseline data for identifying intervention strategies and use in decision and policy making. The Natural Resources and Environment Centre (NAREC), a Faculty of Science initiative and based on market needs, has been established by the University of Malawi to address environmental and natural resources management issues. Local capacity building and skills development re pre-requisites for sustainable management of environmental issues as articulated in Agenda 21 to which Malawi is a signatory.

##### *Contribution to the Malawi Poverty Reduction Strategy*

Malawi's abundant natural resources (forestry, water, land and fish) are dwindling and being exploited unsustainably largely by the poor. About 21% of the Malawi constitutes forest reserves, national parks and wildlife reserves or conservation areas. Forestry and fish account for 12% of the GDP. Until recently, expansion of these sectors has been restricted by management practices, which excluded the involvement of the communities around these protected areas. Despite recent policy enactments, Malawi continues to witness wanton cutting of trees for agricultural land, firewood and charcoal production. Consequently, forest cover has declined by 19% over the last 25 years and expected to continue since demand for wood exceeds production by 33%. This will affect the available sinks for carbon sequestration. Therefore, MPRSP identifies that natural resource management should target forestry, fisheries and wildlife. This entails empowering the community to participate in effective co-management and also promoting alternative livelihood strategies. The latter can be achieved by supporting rural enterprises and value addition to natural resources based products such as non-timber forest products and sustainable agro-based business ventures to enhance income generation capacity of the rural community. Increasing the capacity of the communities and providing a basket full of technology choices is thus a pre-requisite. The Natural

Resources and Environment Centre of the University of Malawi has been established to contribute to enhancement of capacity and skills of the community and partners for sustainable utilisation of natural resources and develop value-added technologies for income generation in order to contribute to poverty reduction in Malawi and hence improved well-being of the population.

#### *Past and ongoing Activities of NAREC*

The Centre has initially concentrated on the following thematic areas: water and land resources management, biodiversity (non-timber forest products, animals etc), climate change, alternative technologies, and advocacy and policy. Training and skills development is a crosscutting issue.

#### *Major projects being implemented include:*

- (i) The Middle Shire Basin Integrated Management Strategy for the Maintenance and Restoration of Ecological Integrity for Sustainable Livelihoods;
- (ii) Strengthening the Capacity of Community-Based Organisations in Utilisation and Management of Natural Resources in Southern Malawi
- (iii) Improving electronic communication within the Camps and with our partners in Malawi and beyond (through technical support of Systems Engineer supported by JICA/JOCV), and
- (iv) Value adding to indigenous Knowledge Systems.

NAREC provides a home for a number of research units already existing and being created, including: the Molecular Biology and Ecology Research Unit; The indigenous Knowledge Unit, Climate Change Unit and Renewable Energy Unit.

The Faculty of Science, under NAREC, has earnestly embarked on capacity building through postgraduate programmes at masters' level. The Masters in Environmental Science (MES) was an important output at the onset of NAREC.

Its activities are discussed in a separate document. The Centre and Faculty are finalising a new programme, MSc (Climate Change Science), which will be offered from September, 2004.

NAREC's facilities are accessible to all members of the University community and those partners from within the Country and beyond its borders. The Centre will collaborate with all persons! institutions that will work towards fulfilment of its objectives and aspirations.

NAREC has a pool of human resources from the Faculty of Science at its disposal and believes that strong and multidisciplinary teams are necessary for quality consultancy work and reports. Offers training courses in writing winning proposals and management

#### *Challenges and constraints*

Funding for development of infrastructure is difficult to source from cooperating partners. The Centre has developed architectural plans for research laboratories incubation centre and working rooms. Implementation of various research ideas is also frustrated by lack of adequate funding. NAREC seeks international cooperation for multidisciplinary research and training programmes.

## 2. HOME ECONOMICS DEPARTMENT

### *Introduction*

The Home Economics department currently has two major activities which aim at improving the nutritional status of individuals in the community as well as creating conducive environment for optimum development of the under five children. Brief descriptions of these activities are outlined below.

### *Project 1: Food processing and quality Assurance*

Vitamin A deficiency is one of the three-micronutrient deficiencies (Vitamin A, Iron and Iodine) that are common in Malawi and the most vulnerable groups are women and children. In Malawi about 60% of the fruits are wasted throughout the year. This is so because of limited knowledge of fruit processing, value adding and post harvest handling. Therefore fruit preservation methods to reduce wastage of these fruits and also add value by processing them into products like jam and juice are being done.

The Home economics Department in conjunction with the Chemistry Department works on enhanced Food processing and Quality assurance of products from Indigenous fruits such as *Strychnos cocculoides* ("kabeza"), *Ziziphus mauritiana* (masau) and *Mangifera indica* (mango). Consumer acceptable products of juices and jams have been made from these indigenous fruits and they store well. Their nutritive values have also been analysed. A group of farmers in Nkhatabay have been trained on how to produce the juice and

jam from Kabeza. We also work with Magomero Food Processing group to share ideas and knowledge on food processing in conjunction with ICRAF-Malawi based in Thondwe. The project is funded by BMZ/GTZ

This project was conceived to increase community capacity in value adding to indigenous fruits for household consumption and increase cash incomes. Thus the training of rural women to produce jam and juice to act, as source of income in addition using these products at family level would be of prime importance.

Such products will also enhance availability of Vitamin A to both women and children.

#### Limitations

- Lack of appropriate equipment—by the college as well as rural communities for food processing and analysis.
- Lack of adequate resources and funds:
  - For the training of rural communities—staff, vehicles, fuel and field expenses.
  - Empowering them to sustain their livelihoods funds to set up production groups, equipment for processing, proper packaging materials and establishment of markets for their products.
- To achieve acceptable impact it is necessary to scale up the activities to cover more districts in Malawi starting with the most poverty-stricken communities. Currently the project is being carried out in Zomba, Mzimba and Nkhatabay districts.

#### *Project 2: Establishment of community based child care centres*

Many children aged two to five years just wander around the villages as parents engage themselves in different activities. Apart from the problem of Malnutrition, which is serious for this age group, psycho-socio care, hygiene and protection for these children are lacking. HIV/AIDS has also increased the number of children that are left without appropriate care. Because of this children are disadvantaged in terms of mental, social, physical, psychological and moral development during this very critical period of development.

To address the above problem the Home Economics Department in conjunction with UNICEF and Ministry of Gender and Social welfare has embarked on establishing Community Based Childcare Centres (CBCC). So far we have initiated Chirunga, Makungula and Jali.

These Community Based Childcare Centres are run and sustained by the communities themselves through parent committees and voluntary care givers. The activities in a CBCC ensure that all children are fed properly, stimulated, protected and well taken care of generally. Essentially the CBCC integrate all the services that target children to ensure holistic development of children and better survival and thriving when they grow up.

#### Limitations

- Training of care givers:
  - Insufficient funds and resources to adequately train care givers.
  - Insufficient funds to monitor activities in CBCC.
- Lack of adequate and appropriate resources for use in CBCC considering that most of these are in remote rural areas.
- Lack of livelihoods to support projects in some areas:
  - Activities that aim at generating income for running the CBCC.
  - Agricultural activities for production of a variety of food stuffs for the CBCC.
- Need for good quality basic structures that are appropriate for early childhood development:
  - Support community efforts to build permanent structures.

### 3. GEOGRAPHY AND EARTH SCIENCES DEPARTMENT

#### *Introduction*

Over the years, Geography has remained popular especially among Bachelor of Education students as a teaching subject. On the other hand, enrolment in Earth Sciences, with Geology as a major component, has gone down significantly with some years even having gaps. Postgraduate studies (Integrated Water Resources management (IWRM) in collaboration with Waternet) and short courses in EIA and GIS are also offered. The newly formed Department of Population Studies is the former Demographic unit of the Department. It first started as a project within the department.

*Objectives of the department*

- (a) Produce Geoscientists who can work in as many areas as possible
- (b) Conduct research activities in order to understand geographical and geological processes that affected our country (Malawi) within the African and Global context.
- (c) Promote collaborative research in various areas of Geographical and Geological Sciences.
- (d) Conduct consultancy services relating to Geography, Geological Sciences and Environmental Science.

**Table 1**

## PRESENT AND PAST RESEARCH ACTIVITIES

<i>Geography</i>	<i>Earth Sciences</i>
— Assessing the impact of drought on children, orphans and women in drought prone areas— Ntcheu, in collaboration with the Gender Studies Unit.	— Lake Level changes in the Lake Malawi — Sedimentation of Lake Malawi — Deltas in collaboration with Syracuse University and Large Lakes Observatory Research Centre, University of Minnesota. — (Mineralogy of the Lake Malawi Basin
— Evaluation of Starter Pack as a food security strategy—in collaboration with the Gender Studies Unit.	— Landslides and floods with the Malawi Geological Survey
— Limestone as a potential source of cement manufacture	— Surface and Groundwater Resources exploration and Water Pollution in Collaboration with the Ministry of Development — Potential mineral resources for agricultural fertilizers in Malawi in the Lake Chilwa Alkaline province

*Importance of Geography and Earth Sciences Education to National Development*

Table 2 shows some vital sectors of National Economy that use geoscientific information with examples of the types of decisions that might be effected. In practice it can be seen that such a list may extend to all areas, however large or small, where human society interacts with the earth it inhabits. Some of the sectors and decisions listed in Table 2 have clear social and economic consequences.

**Table 2**

## THE VALUE OF GEOSCIENCES IN MALAWI

<i>Sector</i>	<i>Examples of Broad Decision sectors that depend on Geographical and Geological Information</i>
Agriculture/Forestry	Pollution risk from pesticides Basic Information for soil categorization Agrominerals research
Waste Management	Location of waste disposal sites eg Blantyre City waste disposal, Mzuzu, Rumphi waste disposals etc
Urban and Regional Planning	Geohazard identification, mapping and land use planning etc
Tourism and-recreation/ conservation	Basis for guides and information at interpretive centers Data for protection of valuable cultural sites
Coastal management	Coastal defence against flooding and erosion along the Lakeshore areas like Mangochi, Salima etc. Shoreline management
Water management Resources/ protection	Information for siting and designing boreholes Information for predicting surface water/groundwater interactions Regional data for catchment management plans Delineation of groundwater protection areas

<i>Sector</i>	<i>Examples of Broad Decision sectors that depend on Geographical and Geological Information</i>
Minerals—Metallic and- Non-Metallic	Mineral exploration Regional resources assessment and extraction planning
Minerals—aggregates and other industrial	Mineral extraction planning Identification of new resources
Construction industry (Road Building etc)	Site surveys Site investigation planning and interpretation Excavation conditions Quality of material to be used
Education/Academic Research	Study maps Intellectual basis for understanding Malawi geology

#### CHALLENGES FACED BY THE DEPARTMENT AND PROPOSED SOLUTIONS

<i>Challenges</i>	<i>Proposed Solutions</i>
— Low enrollment into Earth Sciences programmes resulting in failure to satisfy demand for Earth Scientists in the market.	— Reviewing curriculum in collaboration with major employers and stakeholders to meet current demands and expectations — Need assistance for annual career talks in secondary schools and the general public
— Inadequate teaching personnel resulting in heavy teaching load. Lack of proper policies for capacity building	Need more establishments Reconsider staff exchange programme Capacity building support
— Lack of up to date and adequate teaching and research resources Eg limited teaching space, microscopes and other laboratory equipment, computing facilities books, journals and periodicals, student research funds.	— Encourage collaborative programmes with other institutions — Local and donor support and technical assistance needed
— Lack of resources for field work (eg proper transport, Field geology kits etc) resulting in minimal exposure to the field aspects of Geography and Earth Sciences	— University of Malawi encouraged to include field activities in the allocation of resources — Collaboration with other organizations eg Water Department, Agriculture and Malawi Geological Survey. — Local and Donor strengthening support needed (eg through postgraduate programmes).

#### 4. DEPARTMENT OF BIOLOGY

##### *Introduction*

Established in 1965 and currently with 11 teaching and research staff, the department has, over the past years, grown in terms of research capacity as evidenced by a number of major research projects. Previous projects have included Lake Chilwa Project, establishment of an Insect Museum, Biotechnology, Forest Ecology, Mushroom production, Indigenous fruits, Soil pests and the Lake Malawi Ecology Project.

##### *Mission Statement*

The vision of the Department of Biology is to be a centre of scientific excellence in biological sciences, through teaching at undergraduate and postgraduate levels as well as research. Its mission is to provide qualified human resources in biological sciences and related fields and lead in provision of research and development solutions to problems that affect sustainable management & utilisation of Malawi's environment and natural resources (on which many people rely).

*Research facilities*

Currently the Department has a number of research facilities, which benefit postgraduate students and visiting scientists, both locally and internationally. These include:

- Five teaching laboratories.
- Two research laboratories—one has state of art equipment for Molecular Biology and Ecological Studies.
- Field Station along Lake Malawi.
- Two experimental gardens.
- One green house.
- One screen house and One animal house.

## CURRENT ACTIVITIES AND CONTRIBUTION TO PEOPLE'S LIVELIHOODS

<i>Project</i>	<i>Contributions to People's Livelihoods</i>
Molecular Biology DNA Laboratory	The only DNA laboratory in Malawi working on genetic characterisation of fish, crops, domesticated animals providing information necessary for ensuring food security (animal proteins and carbohydrates from staple food crops) and also for increased income generation at household level. PhD and MSc. Students are being trained from different government Ministries and NGO's who after finishing their studies will work with Local communities. The lab has potential for forensic studies.
Integrated Water Resources Management Project/ Gender Analysis of Access Control & Use of Natural Resources in Southern Malawi	Generating socio-economic and biological data using a participatory approach with local communities. Its objectives are to find out water resources status (availability, pollution), Role of gender in use and management and water catchment's area status. The output will be a Sustainable Water Resources Management Plan developed for the surrounding communities so that they have adequate and safe drinking water.
Mushroom Production Project	Producing mushroom spawn for supply to local farmers so that they become self-employed and improve their livelihoods.
Indigenous Fruits Project	Being done in collaboration with Makoka Research Station to find ways of propagating indigenous fruits so that local farmers can generate income from sale of indigenous fruits while at the same time protecting the environment.
MSc in Conservation Biology	Training Students on conservation of Natural resources and the environment. Students come from government departments like fisheries, National Herbarium and Botanic Gardens and Ministry of Education who are all expected to work with local communities in sustainable utilisation and management of natural resources.

## LIMITATIONS

*Academic Human Capacity*

Currently only three out of 11 members of staff on the ground in the Department are trained up to PhD level. Thus training of Members of staff is one of the priority areas for assistance if they are to effectively carry out their teaching and research duties in order to contribute more effectively to the improvement of people's lives through science and technology research and human development.

*Technical Human Capacity*

The Department has mostly new technical staff, which can benefit from exchange programmes, especially in the field of biotechnology and DNA sample analysis, curation of vertebrates and invertebrates, microbiological procedures, identification of plants and animals, plant and animal dissection techniques.

*Basic Biological Laboratory Equipment*

The Department has very few basic laboratory equipment to run undergraduate and postgraduate training such as new improved microscopes, water baths, ovens and autoclaves as well as reagents to run the DNA laboratory and Microbiology, Physiology and Entomology practicals. This will ensure more human resource is trained in science and technology to contribute effectively in the improvement of people's lives.



### Research Grants

Research grants for basic research especially for young members in the department to build on biological science research since the research and publications committee is currently facing problems due to reduced government funding. This makes it difficult for the department to help local communities in science research that can contribute towards poverty alleviation.

### FUTURE PLANS

The Department wants to be involved in more research activities that aim at protecting the environment on which rural communities depend on and help them to sustainably manage the natural resources to improve their livelihoods through activities like: *Implementation of the Lake Chilwa Management Plan*—To develop activities that will involve the communities effectively implement the management plan that has already been drawn up for the wetland so that they can sustainably manage the resources in and around the wetland in order to improved livelihoods without damaging the environment.

Increase Activities of the DNA Lab—Carry out DNA Analysis of crops and domesticated animals, and natural resources that are crucial in improving people’s livelihoods on which analysis has not yet been done in order to contribute more towards food security and income generating activities in addition to conservation of natural resources.

Mushroom Production—To increase spawn production as well as train local farmers to produce and grow mushrooms as an alternative income generating activity to relieve pressure on the natural resource base. As such we will need to build a spawn production Laboratory and Mushroom Production Demonstration Houses to reach a wider population in the country.

Implementation of the Intergrated Water Resources Management Plan for Lisungwi, Mwanza and Mkulumadzi Rivers—For provision of adequate and safe drinking water while protecting the land and water resources at the same time reducing water borne diseases.

Aquatic weeds—There is concern about uncontrolled growth of waterweeds including the water hyacinth, in the various water bodies, especially the Shire River where major blockages at the electricity generating plants are very disruptive. The weed research aims to make a comprehensive study, both in water bodies and catchment.

Integrated Ecosystems Approach to Malaria Control: the case of the Lake Chilwa Plain—The project aims at formulating alternative malaria control approaches based on ecosystem management practices related to agricultural development and sustainable natural resources utilisation. Such approaches could then be integrated into conventional malaria control strategies to form a sustainable control package. Integrating these methods into current malaria control strategies will enhance affordability and sustainability of vector management programmes for malaria control.

Vermiculture Ecotechnology application in organic waste management and industrial effluent treatment for food security and poverty alleviation in Malawi—The main aim is to reduce poverty through improvement of food production by local farmers and improve environmental quality.

## 5. DEPARTMENT OF CHEMISTRY

### Introduction

The Chemistry Department is one of vibrant departments in the Faculty of Science that uses the limited human, material and financial resources to provide all the key activities of the university. These include undergraduate and postgraduate teaching, research and providing consultancies to both the private and public sectors of the economy.

- (a) Traditional/Herbal Medicine: the Chemistry Department has a long history, dating back to the early 1970s, in research on traditional medicine including mobilising Traditional Healers into user groups and associations, in collaboration with the National Herbarium and Botanic Gardens of Malawi.
- (b) Research on Fuel Blends: This has involved the blending of petroleum-derived liquid fuels with ethanol and has led to adoption of petrol/ethanol blends for commercial use in the automobile industry. Alternative plant sources are being investigated for ethanol production.
- (c) Biodiesel: The project has used under-utilised vegetable oils such as *Jatropha* available in Malawi and locally available ethanol to produce biodiesel to replace imported petroleum fuels as a source of power for maize mills, small generators and other domestic appliances.
- (d) Formulation of weaning food: the popular weaning food (Likuni Phala) for babies, based on locally available nutritious raw materials was formulated under a Chemistry Department–Industry collaboration.

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- (e) Indigenous fruits research: This has centred on characterisation of the nutritional status of wild fruits and value-adding to make them a basis for income generation by the communities through processing, value adding and packaging. Training of the farmer groups in quality assurance has also been emphasised.
  - (f) Research on cassava starch: Properties of cassava starch have been studied and a cassava production industry set up. Results have been applied to initiate production of starch-based cold-setting adhesives as well as hot-setting adhesives for bonding of corrugated boards.
  - (g) Research on cassava cyanogenesis. Robust and field methods for determining total cyanogens (CNp) in cassava roots have been developed. Indigenous knowledge relating to reasons for preferring bitter cassava and correlation between taste and CNp have been established. Various processing technologies and degree of exposure to cyanogens intoxication have been evaluated. Further work is continuing on the chemistry and biology of tropical root crops, especially cassava and sweet potatoes (with the Biology Department).
  - (h) Vegetable oils and essential oils: the research focuses on locally growing plant species that can be a basis for commercialisation. The department has encouraged rural communities to grow lemon grass and citronella and add value by extracting the essential oils to meet the demand of local industries. Investigations on the use of essential oils from lemon grass, citronella and eucalyptus as a source of biopesticides against grain pests to replace imported pesticides has also been carried out.
  - (i) Tree seed products: The department has assessed the potential for product development of tree seeds and working with communities to develop value added products such as edible oils, medicines, water clarifiers and herbal medicines.
  - (j) Moringa and other plant polyelectrolytes: The project was concerned with extraction and testing of polyelectrolytes from plants such as Moringa for water purification and clarification of syrups used in industry.
  - (k) Defluoridation of drinking water: Boreholes, shallow wells, rural piped water supplies and streams are the most important sources of water for domestic and, in some cases, agricultural purposes in rural and sub-urban areas in Malawi. The Chemistry Department is carrying out a study aimed at developing appropriate techniques that will use effective low-cost materials for fluoride elimination in drinking water known to have high levels of fluorides.
  - (l) Industrial consultancy unit: The Chemistry Department has, since inception in the mid-1960s, provided quality assurance services on many products and services in the country on quality control of water, effluent and chemical products from within and outside the country. Although the department works directly with the private sector, the target beneficiaries are the consumers at large across the length and breadth of the country.
  - (m) Science education: The activities involve working with secondary school teachers and students to improve the teaching and learning of science by developing the classroom research skills of the teachers and showing teachers how to use concept mapping and other study skills to develop critical thinking among students.

### *Constraints*

The major constraints in the department are insufficient human capacity to meet the increasing demands, laboratory space that cannot accommodate the large numbers of students due to increased enrolment, insufficient laboratory equipment and materials, and limited funds for meaningful research that can contribute to national development.

## 6. MATHEMATICAL SCIENCES DEPARTMENT

### *Introduction*

Mathematical Sciences department comprises of three sections namely Computer Science, Mathematics and Statistics. It offers a number of consultancies in areas of Information and Communication Technologies such as Software Development Training, Networking, Hardware Maintenance and other IT related; Statistics such as Statistical Data Analysis, Research methodology, statistical modelling; and Mathematics such as modelling and training.

### *Contribution to poverty reduction*

Solving the primary problem of absolute poverty requires effective development and education enhancement programs. One cannot be done without the other. In most cases it also requires interdisciplinary efforts to reach to the root of the problem of poverty. Our department contributes to poverty reduction in a number of areas:

- In disaster preparedness and avoidance using statistics forecasting and time-series analysis.

- In Agriculture, productivity improvement using mathematical models and developing software systems that can keep track of all information for informed decisions.
- In education, training mathematicians, system analysts, programmers, software developers and statisticians.

#### *Past activities*

In the past, the department has offered consulting services and training to various organizations such as National Statistics Office, International Center for Agro-Forest Research, Meteorological Services Department, Sue Ryder Foundation, Decentralisation Secretariat, Center for Social Concern, Center for Social Research, Banja La Mtsogolo, National Herbarium and Botanic Gardens, Ministry of Gender, Youth and Community Services and other individuals. Its members have also conducted research contributing to Police Reform and development of the ICT policy.

#### *Ongoing activities*

- The Department, through the computer section plays an advisory role in Schoolnet—Malawi project which helps to equip secondary schools with IOT equipment and skills.
- The department is offering CISCO Certified Networking courses with online curriculum, labs and examination. Instructors on the ground offer tutorials and practicals. The course is pro poverty reduction as it is heavily subsidised by USAID. At department level, the course is being offered free of charge to all its students.
- The department is offering Ordinary Certificate Course in Statistics. This is offered to civil servants, and as much as it improves their knowledge, it has a role in poverty reduction.
- The department is currently working on the EU–Rule of Law Programme developing software for Malawi Prison Services. The software being developed is pro-poverty reduction as it ensures that justice, fairness and rules are applied consistently to all.

#### *Challenges*

The department is faced with a lot of challenges in the area of both human resource and facilities as outlined below:

- Poor Internet and email connectivity.
- Shortage of Computers for use.
- Shortage of fully trained computer engineers, statisticians and mathematicians due to funds.
- There is high staff turn over! Poor retention of members due to lack of resources for research and poor remuneration packages.
- Limited resources for mathematicians to model environmental problems.
- Lack of funds to collect proper raw data for statisticians to do their research that will help the country.

#### *Areas of assistance*

- Setting up a Computer centre that can be used to provide information and Internet on campus.
- A project on mobile IT training to supplement the centres and this can extend to inmates in their rehabilitation programs to ensure that by time they are released they have employable skills.
- A project to start assembling computers and supplying them to government and schools at affordable prices.
- Set up a statistics centre that could be analysing data for the nation and co-ordinating/keeping track of all research activities in the country.
- Set up a mathematical centre with powerful computers, which can be used to run big programs and simulate environmental mathematical models.

## 7. PHYSICS DEPARTMENT

### *Contributions to poverty alleviation*

#### Research

- (a) Biodiesel project.
- (b) Wood fuel consumption patterns of rural industries in Zomba district.

#### Programmes

- (a) Internet and email service provision.
- (b) CISCO networking training programme.

Areas in need of assistance—Some areas requiring assistance are:

#### Internet connection at Chancellor College and other surrounding institutions

- Acquisition of better networking equipment, like wireless networking equipment, so that we can extend our internet services to Zomba district hospital, National Herbarium, and other institutions.

#### Lab equipment

- We also need better laboratory equipment to better train our students, so that they effectively contribute the cause of poverty reduction in Malawi.

#### Staff Training

- The department has an acute shortage of trained personnel for teaching and conducting research.

#### Research Funds

- We need more funds to sustain ongoing and new research projects.

*June 1004*

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## APPENDIX 83

### Memorandum from Professor Chris Haines

I was, for two years until 2 June 2004, the President of the Royal Entomological Society (RES), and I am Emeritus Professor of Post-Harvest Technology of the University of Greenwich, associated with its Natural Resources Institute (NRI). The RES's earlier Written Evidence to this Committee was submitted under my name on behalf of RES Council, and I was also consulted on drafts of NRI's Written Evidence. I therefore endorse the contents of both those submissions. The Supplementary Evidence below is, however, my personal view and does not represent the views of either the RES or NRI, though parts of it may well be supported by other now-redundant members of NRI (including some Fellows of the RES) who dedicated their careers to the use of science and technology in support of international development in the poorer countries of the world, often working under arduous and challenging conditions.

I joined ODA as a scientist at the Tropical Products Institute (TPI) in 1971 to work on pest management in grain storage in the tropics. With increasing responsibilities, I worked on post-harvest food management in international development at TPI and its successors for three decades: as an ODA civil servant until 1990; as a senior civil servant within ODA's executive agency NRI from 1990 until 1996; and as a University of Greenwich senior manager at NRI from 1996 until 2001. I spent over five years on long-term assignment in Indonesia, providing research, training and advice on behalf of ODA for Indonesia and other countries in South-East Asia. I have undertaken numerous field research activities in South-East Asia, East Africa and West Africa, and have made advisory, liaison and training visits to many developing countries.

I managed the post-harvest component of NRI's ODA-funded R&D programme in the early 1990s, I played a major role in drafting NRI's successful bid for management of the first tranche of the current Crop Post-Harvest Programme of DFID, and I was a member of that Programme's Advisory Committee for its first four years. From the early 1990s I was the senior manager leading NRI's scientific team working on post-harvest issues of food security. In early 2001 that team won a prestigious Queen's Anniversary Prize (the first such award for the University of Greenwich) for its work on "Food Security in the Developing World". I took early retirement at the end of that year and accepted an Emeritus Professor title, which allows me to keep in touch with—and contribute to—NRI's work on food management and marketing in developing countries.

#### INTRODUCTORY COMMENTS

1. Since my experience is in the field of renewable natural resources (RNR), and specifically in food and agriculture, the following submission is focused on the use of science in RNR. I am not qualified to comment on health, environment or civil engineering but I note that individual Committee members have personal expertise or interests in these areas.

2. As a contribution to NRI's preparation of its Written Evidence to the Committee in November 2003, I undertook a review of statistics based on my collection of past reports of ODA/DFID, NRI and the former scientific units of ODA. The review was not drawn on for the written submissions by either NRI or the RES, but it may provide useful information for the Committee. I have therefore edited it and added some commentary, and I attach it as an Appendix to this submission.

3. I have attended all the Evidence Sessions of this Inquiry to date. This supplementary submission focuses on some issues that have been raised during these Sessions.

#### TIME-FRAME ISSUES

4. Most witnesses in the Evidence Sessions have concentrated their answers and data on the present and the recent past. This is perhaps understandable but there is a risk that it is giving the Committee a somewhat distorted view of the role of science in the UK's international development efforts over a longer timescale. The impression has been given:

- that the current and recent status of science and technology in DFID thinking is how it has always been in the past, and
- that improvements in the role of science in DFID in the past two years (or in some cases in the months since the Inquiry began) are substantial achievements, whereas they are insignificant compared with the much greater use of science in development by ODA and its scientific units or agencies in earlier years (as described, for example, in the annual reports of TPI<sup>125</sup> and TDRI<sup>126</sup> in the early and mid-1980s, and in the Reports on Operational Programmes of ODNRI<sup>127</sup> in the late 1980s) and with the far larger technical training programme administered by the British Council in those years.

#### RESEARCH STRATEGY

5. The Committee and its witnesses have, understandably, focused on the development of the proposed new research strategy, though it is perhaps surprising that—in this context—no one has requested or offered information on the existing ten-year RNR research strategy due to end in 2005. The Committee may be interested in its background.

6. When the scientific units—all of which long pre-dated the formation of a government ministry responsible solely for aid—became part of ODA/ODM, they were responsible for deciding their own research programmes within a core-funded budget determined on a rolling three-year cycle. In the case of TPI, it had an independent Advisory Committee with external members (including senior natural-products specialists from developing countries) which conducted an annual review of TPI's programme, passed judgement on progress, and advised the Director on which lines of work to expand and which to contract. Thus—with a relatively light touch and at a low cost—the research programme of the Institute was regularly updated to meet demands and opportunities as perceived by a “panel of wise people” from both the donor and beneficiary countries. The system provided the flexibility to authorize short exploratory forays into new areas as well as to sanction investment (by recruitment) into areas judged to be of long-term importance.

7. In the late 1980s, the merged scientific units (ODNRI) of ODA established a system of matrix management, with Programme Managers responsible for areas of work defined by agreement with ODA (with Programme budget allocations for research). The ODNRI Programmes encompassed not just the ODA-funded research projects but also all related activities in technical cooperation, advice and training, whatever the funding source. In the best-run Programmes this allowed a high level of productive synergy between research priorities and demand “in the field”, similar to that achieved by the earlier TPI management system but with the added advantage that the Programmes were multidisciplinary, drawing skills from the resource-providing traditional Departments in the matrix.

8. In the early 1990s, the top management of the more-succinctly renamed NRI (by now an Executive Agency of ODA) proposed to build on the perceived success of the Programme approach by developing a research strategy. My understanding is that the Director was told that this was an excellent idea but that it was not appropriate for NRI to develop such a strategy: instead, it should be the prerogative of ODA's Natural Resources Division (NRD).

9. At the end of a process of internal debate within ODA headquarters, the NRD issued its first Renewable Natural Resources Research Strategy (RNRRS): the “Yellow Brick” as it was called by NRD advisers and NRI staff alike, on account of the colour of its cover, its bulk and (for many) its impenetrability. It contained many anomalies. Some specific priorities were identified that contradicted the prioritized general categories. Coconut was defined as a hillside crop for post-harvest research because there were clear benefits and opportunities for research in this area but the zonal/sectoral matrix gave a low priority to post-harvest research in coastal areas and thus would have prohibited post-harvest research on coconut. The

<sup>125</sup> Tropical Products Institute.

<sup>126</sup> Tropical Development and Research Institute.

<sup>127</sup> Overseas Development Natural Resources Institute.

highly prescriptive (and rigorously applied) selective country focus caused huge problems for those working on migrant pest problems or cross-border food marketing issues. A focus of my own Department's work at the time was the immigrant larger grain borer which was by then well established in Tanzania and was clearly going to move south through Zambia to Zimbabwe. Tanzania and Zimbabwe were both favoured countries but we were forbidden to use RNRRS funds for research and monitoring of this pest in Zambia, even though this might have helped to slow the pest's southward migration to an RNRRS target country (which subsequently happened).

10. The RNRRS was relaunched in 1995 in its current form, at the same time as the launch of a schedule of outsourcing the management of its individual Programmes. The guidelines for bidding maintained many of the tenets of the "Yellow Brick", such as the country focus, but relaxed the more mechanistic matrix approaches to prioritization of agro-geographic zones and commodities. The successful Programme-management bidding documents have themselves redefined and focused the research strategy in their areas, and subsequent overarching directives from DFID on issues such as local participation, identification of "uptake pathways", and demonstration of impact, have further modified strategic objectives.

#### ODA/DFID IMPLEMENTATION OF ITS RNR RESEARCH OUTPUTS

11. As various witnesses have indicated in the Evidence Sessions, DFID has no effective internal mechanism for comprehending, analysing, promoting and implementing the scientific outputs of its own RNR research programmes and applying them in its bilateral aid programmes. It might seem from what has been said in the Evidence Sessions that this is a relatively new problem arising from a lack of connectivity between the RNR central research strategy and the local priorities of the DFID country offices. It is, however, a long-standing issue in ODA/DFID and may prove institutionally insurmountable for DFID itself, which has to give a considerable degree of independence to its country offices and its London-based geographic desks to adapt to local priorities and situations.

12. However, whilst DFID centrally may not be able to guarantee that its research outputs are put to use in its bilateral programmes, it could do much more to make its country offices and geographic fund-managers aware of the new knowledge available for uptake and implementation. A key factor in this process would be to give its RNR advisers specific responsibility for informing their country offices or regional teams about relevant scientific outputs from DFID-funded research. I believe that many ODA/DFID RNR advisers have never accepted ownership of the outputs of the RNR research funded by their Department, and that this problem has worsened since the research activities have been distanced from them, firstly by the transfer of the scientific units to an Executive Agency and then by the contracting out of the RNR research programme management.

13. This lack of ownership of the RNR research outputs was underlined in the 1st Evidence Session, when the DFID witnesses were unable to provide an example of positive impact of DFID-funded scientific research on a development problem until the adviser from the health sector offered the case of insecticide-impregnated bed nets for malaria control.

#### IMPACT OF ODA/DFID-FUNDED SCIENTIFIC R&D ON DEVELOPMENT

14. As in paragraph 4, above, I recommend that Committee members should consult past reports of ODA's scientific units for earlier examples of the successful application of UK science and technology to development problems. It should be noted, however, that these examples relate to development-focused strategic and applied research conducted by UK scientists having firm academic credentials working with team leaders having first-hand knowledge of development problems and local constraints from in-country experience.

15. Notwithstanding the unwillingness of the witnesses at the 1st Evidence Session to identify examples of DFID-funded scientific research that have solved development problems, there are many such success stories, including those that have in recent years won (or been shortlisted for) DFID's own public awards for best research projects in the RNRRS. Several ODA/DFID scientific research areas have also been the subject of independent economic impact assessments with very positive outcomes. For example, the R&D inputs on pest management of rice brown plant-hopper in South-East Asia and larger grain borer in Africa were both evaluated as having had very high rates of return compared with estimates of potential losses prevented.

16. In 2001, NRI's Food Security Department won a Queen's Anniversary Prize for its work on 'Food Security in the Developing World'. Submissions for these Prizes are subjected to considerable and multiple scrutiny, firstly by several independent adjudicators and then by known clients and peer institutes. The Prize was awarded for our work on twelve projects in five areas:

- Reduction of post-harvest losses in food crops:
  1. Management of the larger grain borer in African maize storage
  2. Community control of rats in villages in Mozambique

- Food safety and pest control for small farmers:
  3. Alternatives to pesticides for pest management in African farmers' grain stores
- Enterprise development for smallholders and agro-processors:
  4. Enhancing production and marketing of indigenous vegetables in Africa
  5. Profitable solar-drying of fruit for Ugandan producers
  6. Improved cassava processing and innovative cassava products in Tanzania
  7. A manual press to relieve women's drudgery in shea-butter processing in Ghana
- Eco-friendly food storage to protect the environment
  8. Modified on-farm grain stores to reduce demand for hardwood in Zimbabwe
  9. Alternatives to methyl bromide fumigation to save the ozone layer
- Sharing knowledge—world-wide dimensions in food security
  10. Training and technology to improve fruit and vegetable marketing in Colombia
  11. Practical post-graduate programmes for professionals in post-harvest technology
  12. Computer-mediated distance learning for mid-career post-harvest technologists.

17. Many of these projects were funded fully or in large part by ODA/DFID. Although the news of the Prize was ignored by the then DFID Secretary of State and the DFID Permanent Secretary of the time, many correspondents within DFID's RNR advisory teams (including the Chief Natural Resources Adviser) recognized that the Prize reflected well on the impact of DFID's investment in R&D on food security.

#### ENABLING ENVIRONMENTS FOR SCIENCE AND TECHNOLOGY

18. During the Evidence Sessions, much has been said about the importance of developing local capability in science and technology, and about formulating priorities and actions in collaboration with local people. It is easy to forget that these activities were undertaken by ODA long before "institutional capacity building", "participatory approaches" and "stakeholder analysis" became vogue concepts in development terminology. Certainly these concepts and associated methodologies have given greater insight into enabling mechanisms, but it would be entirely wrong to infer that ODA's earlier science and technology activities consisted of unadapted technology transfer without local involvement. The following example illustrates the point.

19. In the mid-1970s, the Indonesian Government asked ODA for technical assistance with the skills and operations of its national food logistic agency, BULOG. The initial needs were identified by a joint team of BULOG senior officers and ODA scientists, and changing priorities and needs were regularly reviewed by BULOG and ODA staff throughout the life of the project. Teams from the ODA scientific units and other UK institutions worked closely with BULOG management and staff over the following 17 years to: train pest and quality control staff and store managers in good storage practice; develop improved storage techniques adapted to BULOG's particular needs; establish BULOG's technical development centre for grain storage with its own training teams for technical staff development; test alternative and innovative storage technologies; establish a research and training sub-project on food pest management at the regional institute BIOTROP; develop a sophisticated economic and logistic model that allowed BULOG to identify needs for stock movements between Indonesia's 27 provinces in response to predicted risks of food shortages and price instability; and set up a training scheme for senior management skills and policy analysis. When the Director of TDRI visited the project in 1984, BULOG asked him to give a presentation to its key staff: of the 54 senior staff present, 39 had been trained in practical elements of commodity management at TPI/TDRI. By that stage, BULOG's grain storage practices were arguably the best to be found anywhere in the developing world, and in subsequent years it went on to develop management procedures and innovations that were well in advance of those found elsewhere in the tropics and subtropics.

20. There is a risk that the study of capacity building and participatory approaches can become an end in itself. The ODA-BULOG example, above, shows that real impact in implementing scientific development programmes depends on major commitment by the donor and the recipient institution, over a significant timescale, with a substantial training programme including training of trainers, and with donor-funded scientists working long-term alongside local scientists in joint problem-solving.

#### IMPACT OF STRUCTURAL ADJUSTMENT ON FOOD MANAGEMENT AND MARKETING

21. In the 1950s and 1960s, marketing boards (such as BULOG, above) were established in many developing countries with the encouragement of development donors and retreating colonial powers, such as the UK. The intention was to provide a guaranteed buyer, at a pan-territorial price, for surplus food, and thus to encourage production of staple crops beyond rural subsistence needs, whilst enhancing food security for expanding urban populations.

22. From a technical viewpoint, the advantage of this approach was that they provided central warehousing in which the quality of staple food grains could be maintained with relatively sophisticated techniques, with economies of scale, and with potential for management by a cadre of permanent trained staff. The ODA-BULOG project provided an excellent example of what could be achieved by such a marketing board. However, in some countries, these marketing boards became inefficient or corrupt, and there were suspicions that they were serving the political will of their governments, rather than the wider objectives of food security and price stabilization.

23. The process of structural adjustment promoted by the World Bank and donors such as ODA in the late 1980s and early 1990s was intended to reduce state involvement in economic activities and promote free market enterprise. In most countries this led to the demise or diminution of marketing boards. Contrary to the expectations of political economists, in most countries, entrepreneurial businesses have not emerged to take over grain storage and marketing. Instead, grain storage has been forced back into villages and individual farms, and farmers remote from urban areas have reverted to subsistence food production.

24. Post-harvest scientists working with economists and social scientists on DFID R&D projects are undertaking imaginative research to deal with the immense challenge of developing pest management systems for use in on-farm storage or devising novel economic systems for grain marketing to encourage communal storage. Many of the technologies that can be safely and efficiently used in large warehouses cannot be used in on-farm or village stores due to impracticability, safety or cost. On-farm technologies also tend to be location-specific and thus have much more limited potential implementation and impact than technologies for use in warehouses. In effect, structural adjustment has made many of the proven grain-storage technologies redundant, and has promoted subsistence farming systems rather than encouraging agricultural development.

#### COMPETITIVE BIDDING, TRANSACTION COSTS AND “LEVEL PLAYING FIELDS”

25. Competitive bidding and customer-contractor relations are now an established way of life for most UK science and technology institutions. Ministries such as DFID and other funding agencies claim that this ensures value for money. There are, however, many hidden costs that are often overlooked but reduce the scientific output of the bidding institutions.

26. The first of these is the cost of bidding itself. One distinguished witness to the Committee claimed that he could not understand why other witnesses said that their institutes could not afford to submit bids against long odds. This presumably reflects a difference in perception between those who have mainly worked in institutions receiving a large element of core-funding and those who are working in institutions that have no core-funding. In both cases, time spent on unsuccessful bidding is time wasted and reduces the time spent on doing science. However, in institutions that have no core-funding every person-day that a scientist spends on bidding (whether successful or not) is a day's loss of overheaded fee income to the institute. Major bids can take several person-weeks of effort and even a bid for a modest DFID RNR research project can take several person-days to complete satisfactorily.

27. The transaction costs of “arm's-length” customer-contractor processes, such as those used in the DFID RNR research programmes, include the significant costs of the programme management intermediaries as well as the costs to the implementing institute of reporting progress quarterly and annually against technical and financial milestones.

28. The other cost of the “arm's-length” approach is not a financial cost but a cost in opportunity for scientific dialogue between the implementing contractor, such as NRI, and DFID as customer. In competitive bidding systems, customers are understandably anxious not to be seen to be getting too close to a particular contractor, and several witnesses have reported to the Committee that there are no clear avenues for scientific interaction between implementing contractors and DFID.

29. A similar concern has seen the demise of a scheme that operated successfully for about 25 years from the mid-1960s, with very low transaction costs, and enabled ODA's scientists working in its scientific units to respond directly to technical enquiries from officials in developing countries eligible for UK aid, either by a desk-study and response taking no more than a day or, with approval of the head of department, by a short practical investigation taking no more than 10 days. This scheme represented a very small percentage of the ODA RNR budget but had far-reaching impact on the esteem in which UK technical expertise was held by scientists in developing countries who benefited from the advice.

30. Several witnesses agreed with the view that the untying of aid contracting had led to concerns about “level playing fields” (or, rather, their slopes) both among UK institutions that either possessed or lacked elements of core-funding or other non-allocated income, and between UK institutions and those in countries where core-funding of scientific institutions is still common or where a successful bid for partial funding earns guaranteed top-up of the difference. It is interesting that DFID witnesses claimed not to know of any countries where this was true, whereas others were able to name specific examples.



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 THE RESEARCH COUNCIL PROPOSAL

31. Arising from suggestions that DFID had insufficient in-house scientific expertise to manage scientific research, the idea of an international development research council has been mooted to several witnesses. In general it has been received with cautious approval.

32. Undoubtedly there are very real concerns about DFID's views on the role of science in development in recent years. The longer-term, and more crucial, problem is that ODA/DFID has not developed a mechanism to feed the outputs of its scientific research programmes into its bilateral country programmes (see paragraphs 11–13). The outcome of this Inquiry may encourage DFID to find such a mechanism but the creation of a non-DFID research council would most certainly drive a further wedge between scientific research activities and in-country development programmes, since DFID would then have no ownership at all of the research outputs, which would be technology-driven rather than demand-led.

## CHIEF SCIENTIST

33. Several witnesses have referred to the need for a DFID Chief Scientist, in line with the recent Government decision that all Ministries with scientific activities should have one. It is interesting that no-one noted that, until his retirement and non-replacement two years ago, DFID had a scientist at Assistant Secretary level in the post of Chief Natural Resources Adviser. DFID's portfolio is so wide (health, environment, natural resources, education, land use, engineering, etc) that it is difficult to imagine that one person can successfully fill a DFID Chief Scientist role unless he or she is supported by lead scientific advisers for the key development sectors, thus forming a scientific development team with a strong enough voice to be heard.

*June 2004*

**Annex**

STATISTICS FROM REPORTS OF ODA/DFID, AND ITS FORMER SCIENTIFIC UNITS  
AND NRI, CONCERNING ODA/DFID'S USE OF SCIENCE IN INTERNATIONAL  
DEVELOPMENT IN THE RENEWABLE NATURAL RESOURCES SECTOR  
(INCLUDING FOOD, AGRICULTURE AND THE ENVIRONMENT)

*See end of document for Glossary of Acronyms, References, & Conversion Factors to 2002 Prices*

## GENERAL COMMENTARY

A.1 In much earlier years, it was overtly claimed that one of the objectives of ODA/ODM was to promote the dissemination and implementation of British scientific know-how, and to support UK science in endeavours relevant to overseas development. Even in the 1980s, the ODA report for 1986 (ODA, 1987) reported that "ODA-financed research and development (R&D) in science and technology provides new knowledge and techniques to assist economic and social progress in developing countries." The same report carried a three-page article by Tecwyn Jones on "Pest Control and Plant Protection in Africa," and the ODA Minister of the time, Chris Patten, specifically commissioned a major ministerial initiative to undertake new R&D aimed at integrated pest management. This followed his visit to one of the scientific units of ODA, where he had been impressed by the quality of the science being undertaken and its potential value in tackling pest and vector management in developing countries through environmentally-sustainable and cost-effective scientific approaches to these problems.

A.2 Through the 1990s, mention of science and technology's role in support of international development gradually disappeared from ODA/DFID annual reports, and the DFID report for 2000 had little or nothing to say about advances in scientific knowledge supporting its development programmes (DFID, 2000b). Subsequent DFID annual reports have continued to maintain a low key on this issue, especially in relation to agriculture: for example, the report for 2002 makes very brief mention of three examples of RNR research impact in one box on page 37 of the 94-page report (DFID, 2002b), and only credits one of the scientific institutions involved in just one of the examples (interestingly, not a British institute).

A.3 The 1997 White Paper (DFID, 1997) set the scene for DFID's view of the RNR and science sector in subsequent years:

- it made no reference to the value of science and technology in development;
- it did not use the term "natural resources" at all;
- "agriculture" was mentioned only in the context of international trade barriers; and
- the word "food" was mentioned just three times, once each in the context of land tenure, gender issues, and relief aid, but not at all in relation to sustainable livelihoods.

A.4 The 2000 White Paper (DFID, 2000a) had surprisingly little to say about the role of technology in globalization, and even less about its role—especially in relation to food quality and international standards—in creating opportunities for trade in agricultural commodities. The 2002 strategy paper on

eliminating hunger (DFID, 2002a) was issued to coincide with the World Food Summit and was intended to counter the view that food security is a tractable problem *per se* by emphasizing the primal role of poverty as the cause of food insecurity. It argued that sufficiency of food production and efficiency of food marketing were not key factors in food security: in doing so, it ignored the linkages between elimination of poverty, encouragement of economic growth, and the vital role of the rural economy (centred on food and agriculture) in the economies of most developing countries.

#### THE STATISTICS

A.5 The data in this Appendix have been extracted from a selection of reports by ODA/DFID, and by NRI and the former scientific institutes of ODA from the past two decades (the selection being governed by the author's personal document collection).

A.6 The types of measure of scientific effort and expenditure vary greatly, sometimes between successive years, and comparisons should thus be made with caution. Categories also vary, with some reports detailing (for example) expenditure on agricultural R&D, and others only giving total RNR R&D expenditure.

A.7 Another cause of confusion concerns what is categorized as science and what is defined as research. More is said about this in the Conclusion below, but the statistics do not include NRI reports of proportions of income by Frascatti categories (in the period when these were in vogue), since these data were created with best intent but represented unreliable statistics compiled by apportioning total project budgets between the categories.

A.8 All sterling values for expenditure by ODA/DFID and income for NRI and its predecessors have been converted from those cited for the reported year to year-2000 price equivalents: the multipliers are listed at the end of this document.

#### LONG-TERM TECHNICAL-COOPERATION ASSIGNMENTS

A.9 Long-term assignments for scientific technical cooperation in the RNR sector have decreased dramatically over the past quarter of a century. At the start of the 1980s, as previously, many staff of the Tropical Products Institute (representing only the post-harvest and market-economics activities of the wider scientific work of ODA) were undertaking long-term TC assignments (TPI, 1984): 40 staff in 1980–81; 41 in 1981–82; and 38 in 1982–83. In 1983–84, 52 staff of the amalgamated Tropical Development and Research Institute (formed by the merger of TPI and COPR, and representing most of ODA's RNR activities except land use) were on long-term assignments (TDRI, 1985a). By 1984–85, the rather smaller number of 42 staff of TDRI were on long-term assignments (TDRI, 1985b), marking the start of the fall.

A.10 Over the next few years the numbers of staff on such assignments fell considerably in spite of the amalgamation of TDRI and LRDC into the Overseas Development Natural Resources Institute as the single scientific arm of ODA: in 1987 only 34 staff of ODNRI were on long-term missions (ODNRI, 1988); and in 1988 just 19 staff were on such missions (ODNRI, 1989). This trend has continued unabated and very few staff of the now university-based Natural Resources Institute have undertaken long-term assignments in recent years, nor is there evidence that there is a significant programme of RNR technical co-operation serviced by other institutions or private consultants.

A.11 In interpreting these figures, it should be noted that, until 1990, the scientific units were an integral part of ODA, staffed by ODA's scientific civil servants. Thus, the diminution of long-term missions represents a real and substantial decrease in ODA TC activity in the RNR sector during the 1980s, even though a steadily increasing proportion of the units' staff were socio-economists rather than natural scientists and engineers.

#### STAFFING OF ODA/DFID'S FORMER SCIENTIFIC UNITS AND THE CURRENT NRI

A.12 In 1986, ODA's scientific units (TDRI and LRDC) had about 375 scientists, technologists, engineers and economists (ODA, 1987). In 1987, only 332 of the total 453 staff of ODNRI were in science or other professional grades (ODNRI, 1988). Identical figures were reported for 1988 (ODNRI, 1989). In 1989, ODA described ODNRI as having 350 experienced scientists (ODA, 1989). By 1990–91, NRI reported having over 500 staff, including those transferred from the former ODA Corps of Specialists, but no breakdown was recorded between professional specialists and administrators (NRI, 1991). In 1991–92, NRI reported having 550 staff, but again gave no breakdown between professional specialists and administrators (NRI, 1992). In 1992–93, NRI had a total staff of 557, with 419 in the scientific operational divisions (including a few divisional administrative support staff) and 138 in corporate support and management services (NRI, 1993).

A.13 In preparation for NRI's privatisation, staff numbers were reduced significantly by compulsory redundancy before the start of financial year 1995–96. During 1995–96, total NRI staff numbers were reduced even further from 483 to 373 by voluntary redundancy and natural wastage (NRI, 1997) prior to transfer to the University of Greenwich. Research and technical cooperation income from DFID continued to fall faster than the income from other clients was increased, but total staff numbers remained at over 300

through the rest of the decade, until the crisis of 2001 and the compulsory redundancy round that led to the current (November 2003) NRI staffing level of 101, comprising 84 scientific and technical staff and 17 administrative support posts.

#### NRI INCOME<sup>128</sup> for RNR Activities as a DFID Executive Agency 1990–96

A.14 In FY 1990–91, NRI income (turnover) from ODA’s Natural Resources Division (NRD) for research and advice was £18.4 million and from ODA’s other Divisions (mostly its Geographical Divisions) for bilateral technical assistance and consultancy was £11.3 million (NRI, 1991). Of this, retained fee income (including administrative staff overheads) was £11.9 million from NRD and £7.3 million from Geographical Divisions (NRI, 1991): the remainder was for re-imbursables (mainly travel and consumables).

A.15 In FY 1991–92, NRI income (turnover) from NRD for research and advice was £22.3 million and from Geographical Divisions for bilateral technical assistance and consultancy was £9.9 million (NRI, 1992). Of this, retained fee income (including administrative staff overheads) was £17.2 million from NRD and £6.5 million from Geographical Divisions (NRI, 1992).

A.16 In FY 1992–93, NRI income (turnover) from NRD for research and advice was £25.6 million and from Geographical Divisions for bilateral technical assistance and consultancy was £10.9 million (NRI, 1993). The NRI Report for 1992–93 did not report retained fee income *per se*, but the business volume assessed in “operational years” was down by 3.5% on 1991–92 for NRD and up by 7.4% for Geographical Divisions (NRI, 1993): however, these “operational years” were not a reliable measure of retained income, and also included the costs of administrative staff overheads. The annual report (NRI, 1993) noted that in this financial year, ODA spent £104.7 million on aid for the renewable natural resources sector and that nearly 28% of this was spent on services either provided or managed by NRI (though the latter did not represent a primary scientific input and included a very high level of non-retained income).

A.17 In FY 1994–95, NRI income (turnover) from NRD for research and advice was £23.4 million and from Geographical Divisions for bilateral technical assistance and consultancy was £11.0 million (NRI, 1997). Retained fee income data for this year were not reported.

A.18 In FY 1995–96, NRI income (turnover) from NRD for research and advice was £17.9 million and from Geographical Divisions for bilateral technical assistance and consultancy was £11.8 million (NRI, 1997). Retained fee income data for this year were not reported.

A.19 The reported increases in NRI income from ODA in inflation-adjusted terms during the early 1990s do not square with the progressive belt-tightening that NRI scientific teams underwent following the relocation to Chatham and the imposition of Executive Agency status. This suggests that an increasing proportion of the total income was being spent on support services, other overheads, and travel costs for short-term visits, rather than on fees for scientists’ inputs to development projects. To some extent, these additional costs were the result of ODA’s loss of over 350 scientists from its own ranks and thus the need to use proxy measures of project progress that were additional to the normal scientific outputs of reports and scientific papers, since they could no longer use internal peer assessment of the outputs themselves. NRI also increasingly shouldered the financial burden of the overheads of a relocation site that had been selected for political rather than operational reasons and which was unsuited to its function as a scientific institute for international development. And the steadily increasing demand for competitive bidding and management at arm’s length progressively added both to the business-winning costs of NRI and to the management-percentage of DFID’s RNRRS programme expenditure.

#### ODA/DFID SPENDING<sup>129</sup> on RNR R&D

A.20 In 1986, ODA spending on all R&D was £35.6 million, of which £20.0 million was on agriculture and other RNR (ODA, 1987). ODA spending during the period 1988–93 on all R&D was as follows (from ODA, 1993): 1988–89, £47.7 million; 1989–90, £49.2 million; 1990–91, £51.9 million; 1991–92, £58.8 million; and 1992–93, £72.9 million. The upward trend was mainly due to large proportional increases in spending on energy, engineering, health and population, and economic and social R&D, though there was also a moderate increase in RNR R&D. The equivalent figures for R&D on RNR were as follows (from ODA, 1987): 1988–89, £31.0 million; 1989–90, £32.9 million; 1990–91, £31.9 million; 1991–92, £36.9 million; and 1992–93, £42.5 million.

A.21 In 1994–95, ODA total R&D spend was £70.3 million and the RNR R&D spend was £40.8 million, showing a downturn from 1992–93. In the late 1990s the RNRRS Programmes returned to the lower levels of the start of the decade in real terms as follows (from DFID, 2000b): 1996–97 outturn £31.9 million; 1997–98 outturn £26.9 million; 1998–99 outturn £31.2 million; and 1999–2000 estimate £33.8 million.

<sup>128</sup> Sterling values converted to 2002 prices—see table at end of document for multipliers used.

<sup>129</sup> Sterling values converted to 2002 prices—see table at end of document for multipliers used.

## CONCLUSIONS

A.22 The figures for total expenditure on ODA/DFID's RNR R&D (adjusted to 2002 prices) could be used to argue that there has been well-sustained spending on scientific R&D in this sector for the past two decades. However, the following factors need to be taken into account:

- the “sharp-end” of the RNR R&D science budget has been increasingly spent not on natural sciences and engineering but on economic evaluations (especially in the 1980s) and, more recently, on sociological analysis and community participatory studies;
- prescriptive project-framework approaches have led to the disappearance of truly strategic research projects, however relevant to development issues, and their replacement with applied research projects with more predictable outcomes;
- more recently, the pressure to demonstrate impact of research results (or at least local acceptance of responsibility for their implementation) within a three-year project timeline has driven research proposals even further “downstream” from applied research to adaptive research, with little or no scientific innovation involved;
- in the late 1990s, the word “research” itself became a taboo in DFID and the RNRRS was for some time referred to as the Renewable Natural Resources Knowledge Strategy, as being more politically correct in DFID policy terms;
- although ODA/DFID statistics are opaque on the issue, it is obvious from the diminution in TC activity in TDRI/ODNRI/NRI in the past 20 years, and from observations in target countries, that ODA/DFID's bilateral scientific TC in the RNR sector (especially in agriculture and food) has been greatly reduced: it is sometimes argued that this is because of over-arching political rejection of the principles of TC, but observers report that there are still large numbers of DFID-funded TC consultants on the ground transferring UK knowledge in health and education; and
- there remains a long-standing lack of connection and feedback within DFID between its R&D outputs—for which it seems to take no responsibility and claim no ownership—and its bilateral country programmes.

## GLOSSARY OF ACRONYMS

COPR	Centre for Overseas Pest Research of ODA/ODM 1965–83, formerly under other Departments
DFID	Department for International Development 1997–date
LRDC	Land Resources Development Centre of ODA/ODM
NRD	Natural Resources Division of ODA/ODM
NRI	Natural Resources Institute of ODA/DFID 1990–97 and of University of Greenwich 1997–date
ODA	Overseas Development Administration, various dates until 1997
ODM	Ministry of Overseas Development, various dates until 1979
ODNRI	Overseas Development Natural Resources Institute of ODA 1987–90
R&D	research and development
RNR	renewable natural resources
RNRRS	Renewable Natural Resources Research Strategy of ODA/DFID
TC	technical cooperation
TDRI	Tropical Development and Research Institute of ODA 1983–97
TPI	Tropical Products Institute of ODA/ODM 1965–83, formerly under other Departments

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#### CONVERSION FACTORS TO 2002 PRICES

The following multipliers were used to estimate sterling value equivalents at 2002 prices:

1984 x 1.98	1987 x 1.73	1990 x 1.40	1993 x 1.25	1996 x 1.15	1999 x 1.07
1985 x 1.86	1988 x 1.65	1991 x 1.32	1994 x 1.22	1997 x 1.12	2000 x 1.03
1986 x 1.80	1989 x 1.53	1992 x 1.27	1995 x 1.18	1998 x 1.08	2001 x 1.02

*Prof C P Haines*

10 November 2003, with minor amendments and additional comments 28 June 2004

## APPENDIX 84

### Memorandum from the Commonwealth Scholarship Commission in the United Kingdom

#### SCHOLARSHIPS, SCIENCE & DEVELOPMENT

##### BACKGROUND

The Commonwealth Scholarship Commission in the United Kingdom is grateful for this opportunity to present a short note of evidence to the Committee so late in its current inquiry. Our main reason for doing so is one of concern that the Committee session on 26 April, which considered scholarships, did not have access to information about our work. We are now submitting evidence both to ensure completeness, and to draw the Committee's attention to a number of innovations and policies adopted by the Commission in recent years, which appear to relate directly to policy issues raised by Committee members.

The submission is divided into two main sections. The first is a general description of the Commission, its current provision and the role of science and technology awards. The second offers comment on three areas of policy which were of interest to the Committee at its April meeting. These are the extent to which impact can be measured and enhanced, the potential for greater synergy and collaboration between scholarship schemes and other forms of development, and the need to ensure that the objectives of HMG in offering scholarships are supported by rigorous and competitive selection methods. We conclude with some observations regarding our relationship with our sponsoring departments.

##### THE COMMONWEALTH SCHOLARSHIP COMMISSION

The Commonwealth Scholarship Commission (CSC) was established by Act of Parliament in 1959 and now operates under the International Development Act 2002. The Commission is a Non-Departmental Public Body in its own right, with funding from the Department for International Development (£11.75 million) in the current year, and Foreign and Commonwealth Office (£2.05 million). In terms of size, this represents about one-third of the resources available to the Chevening programme, but considerably more than the Higher Education Links Scheme and Dorothy Hodgkin Scholarship Schemes, which the Committee discussed at the April meeting. FCO funding is targeted specifically on awards for citizens of those Commonwealth countries that do not qualify for development assistance.

The main function of the Commission is to manage the United Kingdom's contribution to the international Commonwealth Scholarship and Fellowship Plan (CSFP). The CSFP was instigated at the first Conference of Commonwealth Education Ministers, also in 1959. The Plan provides a framework

through which governments of Commonwealth nations can offer awards to citizens of other member states. Although the aims are primarily developmental, this structure also offers opportunities for UK students to study in other Commonwealth countries, with funding from within the host country. The extent of this activity is much smaller than the inward flow of students to the UK under the scheme, but involves approximately 40 students at present, in locations as diverse as Brunei, Canada, India, New Zealand and South Africa.

The principal, and continuing, activity of the Commission is to select and award scholarships. This is done through a three-stage process. Candidates are nominated, generally by an agency within their own country. Applications received in London are then sent by the Commission secretariat to an academic assessor in the appropriate discipline—almost invariably holding a senior academic post within a British university who grades and comments on them in a standard format. A sub-committee of the Commission, with members from both the sciences and the humanities or social sciences, then makes a final selection, using a weighting system as set out in annex 1. The first is for DFID funded candidates from developing countries, the second for FCO awards.

#### CURRENT PROVISION

For most of its history, the Commission confined its provision to conventional postgraduate awards, and shorter Fellowships for mid-career staff in developing country universities. In recent years, however, there has been significant innovation, as the table below demonstrates:

NEW AWARDS: 1999–2003

	1999	2000	2001	2002	2003
General Scholars	191	134	184	230	222
Distance Learning				89	163
Academic Fellows	87	73	67	77	74
Professional Fellows				23	51
Academic Staff Scholars	51	22	31	30	32
Split-site Scholars	13	11	18	30	30
Total	342	240	300	479	572

Several of these initiatives were designed to address the concerns identified by the Committee at the 26 April meeting. The Split-Site awards provide an opportunity for those studying for doctorates in their own (developing) country to spend up to one year in the United Kingdom. They seek to contribute to the stock of PhD's in those countries at relatively modest cost, without the need for candidates to leave their countries for long periods and in a way that promotes collaboration between universities in the UK and developing world. Distance learning awards likewise seek to provide qualifications and expertise, without the need for candidate to leave their own country. The majority of our programmes are offered through partnerships between the UK and developing country institution, and aim to develop institutional capacity as well as provide skills for individual recipients. They also fill a gap in scholarship policy. Generally, overseas students wanting to follow a British university distance learning course cannot obtain local scholarships (because they are not studying in a local institution) or an overseas scholarship (because they are not planning to travel overseas to study). Professional fellowships provide an opportunity for mid career professionals in areas other than academia to spend time with a UK host organisation. The emphasis here is on development of specific skills rather than undertaking a research project or gaining a qualification. Again, there is evidence of a considerable catalytic effect in terms of longer-term relationships.

These schemes are still at the experimental stage. It will be some years before a full evaluation of impact—and completion rates—can be carried out. It is important to recognise that the majority of our budget is still devoted to “conventional” postgraduate awards in the United Kingdom. We would particularly draw attention to two aspects of this provision. First, although there has been some movement towards “taught” postgraduate courses in recent years, in response to the vastly increased provision in this area, the Commission has been clear in its determination to preserve doctoral awards as a key part of its provision. Second, we have retained specific provision for awards to young and mid-career staff of developing country universities. The importance of these elements will become clear in the discussion of impact below.

#### PROVISION FOR SCIENCE AND TECHNOLOGY

At its April meeting, the Committee expressed some concern at the low proportion of awards devoted to science and technology under the Chevening scheme. Mr Kay, in particular, noted that some 6–6.5% of new awards were in the area. As the table below demonstrates, the Commonwealth scheme has regularly maintained a much higher level than this:

## SCIENCE AND TECHNOLOGY AS A PROPORTION OF NEW AWARDS: 1999–2003

<i>Year</i>	<i>% Science and Technology*</i>
1999	51
2000	55
2001	47
2002	51
2003	44
Total	49

\* Science and Technology includes Pure Science, Technology, Medicine, Dentistry and Veterinary Science. The total percentage over five years was made up as follows: 39% Pure Science and Technology, 9% Medicine and Dentistry and 1% Veterinary Science.

Science and technology feature in all of the Commission's programmes. Computer science, water engineering and health sciences are, for example, amongst the topics for which distance learning is supported. We would, however, attribute the higher proportion of science and technology awards offered by the CSC to three factors in particular:

- (a) our continuing provision of doctoral awards. There is evidence that the most promising scientists seek to move to doctoral study as quickly as possible, without undertaking a Masters degree first. In this context, there is a considerable difference between disciplines.
- (b) The fact that CSC awards reflect local demand and priorities. The overwhelming majority of nominations for our scholarships come from national government agencies and developing country universities. The developmental need for scientists and technologists in such universities means that they continue to seek scholarships in these areas.
- (c) The strong representation of science and technology in our selection process. As noted above, every nomination for a Commonwealth Scholarship is reviewed by a specialist advisor in the subject area concerned, whilst all of our selection committees have two (and in some cases three) scientists out of a total membership of five.

## MEASURING IMPACT

At their 26 April meeting, Committee members were concerned to ensure that the impact of scholarship schemes, on developing countries in particular, was measured and maximised. This is an issue to which the Commission has paid particular attention in recent years.

Measuring and maximising impact are separate, though related, issues and we look below at some of the problems of measurement. On maximising impact we have worked on the assumption that raising the level of qualifications of the staff of developing-country universities will bring long-term benefits to the universities and their host institutions. There is some evidence for this common-sense view that better-educated staff will perform better as teachers. To some extent, therefore, we can legitimately use short-term proxy indicators for long-term impact. On degree completion rates, our scholars achieve rates comparable to those for students funded by the research councils, whilst the proportion of our scholarship holders who return to their own country, is discussed below. Thus, we have positive evidence on the efficiency of our scholarship process and have been concerned to go beyond this and seek further evidence about effectiveness.

Most scholarship schemes can offer anecdotal evidence of the impact made by particular individuals. The CSC is no exception, as our most recent annual report (attached to this submission) demonstrates. Given that over 14,000 individuals have held Commonwealth awards in the United Kingdom, however, we do not believe that pointing to specific successes in itself represents sufficient justification for the public expenditure involved.

The Commission has therefore invested resources in recent years into a more widespread "tracer study". As a result, we have established contact with over 4,000 of these award holders, and the number is continually increasing. This activity led, last October, to the publication of the first ever *Directory of Commonwealth Scholars and Fellows*. The Directory, which included career profiles as well as a register of alumni, offers a much better insight into the *generality* of alumni experience.

Two points emerge particularly strongly. First, the vast majority of alumni have returned home, and worked there. We agree with the point made by Sir David King to the committee that the question of whether alumni return home is not as simple a question of “good” and “bad” as might commonly be supposed. There are a number of examples of alumni working outside their own country but still making a contribution to its development. Nonetheless, as a crude indicator it is pleasing to note that something above 85% of those identified to date have returned to their own (developing) country.

We suspect that this figure is slightly higher than for some schemes. The Canadian authorities, for example, found that 71% of those who had studied for Commonwealth Scholarships there had returned. We cannot be certain of the reasons for this, but three possibilities can be advanced. First, the higher proportion of our awards that are devoted to individuals who are already embarked on a career in their own country—particularly in higher education. Second, the fact that candidates are expected to sign an undertaking to return to their home country, which in some cases is backed up by a “bond” with their home government or university. Third, it may be that Canada suffers in this respect from its close proximity to the United States. It is noticeable that, of those who did not return in the Canadian study, more were now working in the US than had remained in Canada.

The second point to emerge from our tracer study is the high proportion of our alumni—well over half—working in higher education. In some ways, this is not surprising, since considerable numbers of awards are set aside for those already working in this sector, with the specific intention that they should return to their previous employer. In developing countries, where the tendency is perhaps strongest, this also reflects the question of where else in the local labour market could absorb such highly qualified staff.

We have considered at some length whether this concentration is a “good” or “bad” thing. On balance, we think the former. Higher education staff are well placed to have a catalytic effect on society, both through teaching and research. Our alumni profiles also show them as very likely to have further impact on policy, through work for government and international bodies. As a profession, academic are more likely to retain international contacts than most, and perhaps be a force for independent thinking within their countries.

The tracer study findings help us to move beyond anecdotal evidence as the main source of evaluation. There is still a need, however, to address the point made by Mr McWalter at the 26 April meeting of the committee—that alumni should be able to utilise the high level skills obtained on their awards when they return home. A number of our alumni report a feeling of isolation on their return, and a lack of equipment or other facilities is sometimes cited as a reason for this.

During the past year, the Commission has been considering how this problem could be addressed, bearing in mind that, as a scholarship provider, we do not have the funds or legal remit to provide significant infrastructure to developing country institutions. Three proposals have particularly emerged, which we will be piloting over the next year:

- (a) there is a need for much greater systematic contact with alumni. In the past, scholarship schemes have tended to maintain contact through newsletters and occasional receptions, but failed to engage in on-going dialogue, still less provide opportunities for alumni to engage with *each other*. As an attempt to ease this problem, we are about to establish a series of “*professional networks*” for alumni that appear to have similar vocational interests. At the very least, each network member should receive a regular e-mail updating them on current developments in their field. We hope, though, that the network will serve as a catalyst for much stronger activity over time.
- (b) We are considering the possibility that the Commission could earmark small numbers of grants towards certain institutional projects, thereby reducing the feeling of isolation from alumni on their return. This has led us to develop the concept of *Institutional Capacity Grants*. Such grants allow up to six individual awards to be allocated towards a particular initiative, to which the home institution has also offered support. The idea is to ensure that recipients are returning to work which is relatively well funded, and colleagues who have had similar training opportunities. The grants can be taken up over a four year period, to prevent too dramatic an outflow of staff at any given time. The first two such grants, for projects in Malawi and Papua New Guinea, were offered last year.
- (c) A further possibility, which we have just begun to explore, is that of collaboration with other development agencies. Although the Commission’s legal brief is confined to scholarships and fellowships, other bodies have prioritised the development of infrastructure. The development of joint activity programmes with these could offer a further way of ensuring that the training which we are able to give is effectively used on return. We are currently engaged in discussions with the Carnegie Corporation of New York and International Development Research Centre, based in Canada, regarding this possibility.



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### *Co-operation between Government Programmes*

At its 26 April meeting, the Committee considered the extent of collaboration between schemes currently offered HMG, and the departments that offer them. It was noted, in particular, that the recent Scholarships Review undertaken by the Foreign Office has recommended more collaboration. The Commission has been considering how it could contribute to this process.

The Commission is well placed in this regard, since already has a formal structure to review provision, which brings together our two funding departments. To extend representation further, we have recently invited the Department for Education and Skills to be represented at Commission meetings. There is no reason, subject to DFID and FCO approval, why similar invitations could not be extended to other interested government departments. We already have funding support from two government departments.

Two other initiatives are also being developed to contribute to this process:

- (a) We agree with the comment made by Dr Anderson at the committee hearing that the potential exists for greater collaboration between scholarship schemes and the Higher Education Links Scheme, and have been undertaking this for the past three years. In its present form, the HEL provides only very basic support for institutional linkages, through occasional visits and small scale consumables. Scholarship schemes can dovetail with this process by adding support for manpower. The Commission's split-site programme, which allows recipients to have a base at both institutions, is particularly appropriate for this. We have, since 2001, invited HEL projects to nominate candidates for such awards, and several have been successful. We would like this relationship to continue with the new style HEL scheme that will operate from 2006. We would also like the relationship to be reciprocal, with returning CSC award holders who return to work in the university sector being encouraged to develop HEL proposals as a means of continuing collaboration with their UK institution.
- (b) There is considerable potential for collaboration between DFID funded research projects and scholarship schemes. This would ensure that key researchers from developing countries receive their doctoral training in conjunction with a real life research project. It would thus establish for young staff of developing country universities the link between research and training that has long been recognised by the Research Councils and other bodies in the UK. We would expect the number of opportunities for such collaboration to increase still further as developing country universities become more involved in DFID research programmes, as a result of untying aid. As a first step, our recent review of activities has proposed that long-term DFID research projects be invited to nominate directly nominate candidates for Commonwealth Scholarships from 2005.

### *Selection Methods and Criteria*

The issue of *how* recipients of UK scholarships are selected, which was also touched upon by the Committee, is vital to ensuring impact. We would like to add three points to this debate.

First, we believe that *diversity* in selection methods can be beneficial. This is all the more so since there are clearly different objectives in offering scholarships. At present, Chevening award recipients are selected mainly through British High Commissions in the countries concerned. In the Dorothy Hogkin, ORS and DFID Shared Scholarship Schemes, much of the process is left to the UK host university, operating within broad criteria. For Commonwealth Scholarships, nominations have historically come from government agencies and universities, and we are broadening out this process somewhat. Each of these routes are likely to address different "markets", thus helping to ensure that Britain maximised its opportunity to attract the "best candidates". While we are not complacent about the Commission's methods the track record of our nominating agencies, and the fact that their procedures are familiar to universities and a broader public in the countries where they are working, give them particular strength. This is demonstrated by the continuing flow of applications from well-qualified and able students.

Second, we believe that more work needs to be done to define *selection criteria*. It is likely that these will be different between schemes, reflecting the priorities of sponsoring departments, but the more transparent these are, the better. The Commission been considering its own procedures in this context, and earlier this year introduced the new system for "scoring" applications, referred to above. We would accept that the criteria would benefit from considerable refinement, but have found them to be a useful starting point.

Third, the achievement of strategic objectives—whether the attraction of high quality candidates or promotion of specific subject areas such as science—can best be achieved by introducing as much *competition and rigor* into the system as possible. In our view, this should involve competition between candidates from different countries and universities, specialist advice on each individual application and a final selection meeting based on clear criteria of the type described above. Of course, there are limitations on the number of applications that can be handled in the UK—hence the need for in-country nominating routes to act as "filters". We believe, however, that a strong element of competition needs to be retained in the UK process in addition.

*Relations with Sponsoring Departments*

From the text of its hearing in April, it appears that the Select Committee is keen to learn more about the role of science throughout government. We would therefore conclude with some observations about our links with the two Departments that sponsor the work of the Commission.

During the 1990's, financial support for Commonwealth Scholarships from both departments fell in real terms. In recent years this trend has reversed somewhat. Support from DFID has increased by 27% in the five years to 2003–04. FCO funding declined in the period from 1999–2001, but in the three years since has risen by 17%.

It is fair to say that Commonwealth Scholarships have not represented a priority for either department in recent years. In the case of DFID, scholarships (and higher education generally) has not always been seen as central to the achievement of Millenium Development Goals and associated targets for the eradication of poverty. For the FCO, attention has been focussed on the expansion of the Chevening Scheme. This was largely because Chevening, to the exclusion of other scholarship schemes, formed the sole basis of the Prime Minister's target for an additional 1,000 scholarships.

Within these constraints, however, both departments have shown considerable willingness to engage, and listened to new views. In the case of DFID, a significant budget increase was awarded in 2002 to implement a series of new initiatives identified by the Commission. This process was personally encouraged by the then Secretary of State. The Foreign Office, despite the obvious temptation to reduce Commonwealth awards to further fund the Prime Minister's proposed expansion of Chevening, accepted that the Commonwealth scheme had distinctive features of its own, which should be retained. We believe that the more focussed approach displayed during the recent review of FCO scholarships, for example the increased emphasis on quality and acceptance that doctorates have an important role to play in scholarships policy emphasis on quality, and, for example, are further welcome steps.

In short, we believe that the Commission's relationship with both departments is good, but could be improved still further by closer contact with other areas of their work. In the case of DFID, we have described proposals above for greater interaction with their wider research programmes, and have already begun collaboration with the Higher Education Links Scheme. For FCO, we are seeking greater contact with British High Commissions, particularly in the field of alumni relations and follow up. Both departments have actively encouraged these developments.

Finally, we have been extremely encouraged by the recent decision of DFID to provide the Commission with an indicative three-year budget, to 2006–07. As the recent FCO review found, continuity of planning is a particularly important area in the field of scholarships, and we hope that this longer-term time horizon will continue in future.

June 2004

**Annex 1**

**GRADING SYSTEM FOR ASSESSMENT OF APPLICATIONS FOR COMMONWEALTH  
SCHOLARSHIPS TENABLE IN THE UNITED KINGDOM 2004**

**DFID AWARDS**

<i>Grade</i>	<i>Academic Merit</i>	<i>Quality of Study Plans (Doctoral)</i>	<i>Quality of Study Plans (Masters)</i>	<i>Development Impact (DFID Candidates)</i>
Factors taken into account	<ul style="list-style-type: none"> <li>– Examination results.</li> <li>– Academic transcripts.</li> <li>– Tutors and referees' reports.</li> <li>– Any academic prizes.</li> <li>– Other relevant activities.</li> <li>– Publications, where appropriate.</li> </ul>	<ul style="list-style-type: none"> <li>– Extent to which the work programme has been well researched and thought out, including the identification of appropriate institution and supervisor.</li> <li>– Degree of innovation.</li> <li>– Likely impact.</li> <li>– Clarity.</li> <li>– Relevance to field.</li> <li>– Relevance for future career.</li> <li>– Feasibility</li> </ul>	<ul style="list-style-type: none"> <li>– Extent to which the proposed course/ institution of study has been well researched (including specific options and dissertation topics, where appropriate) and presented.</li> <li>– Extent to which choice fits well with the strengths and possible future career of the candidate.</li> </ul>	<ul style="list-style-type: none"> <li>– Extent to which the planned work and the individual are likely to contribute to the development of the home country.</li> <li>– Relevance of work to the development needs of the home country.</li> <li>– Past commitment to national needs</li> <li>– Extent to which development needs of the home country are integrated into future plans</li> </ul>

<i>Grade</i>	<i>Academic Merit</i>	<i>Quality of Study Plans (Doctoral)</i>	<i>Quality of Study Plans (Masters)</i>	<i>Development Impact (DFID Candidates)</i>
A Plus	<ul style="list-style-type: none"> <li>– Outstanding past performance.</li> <li>– Likely to be in top 15% of UK postgraduate cohort.</li> </ul>	<ul style="list-style-type: none"> <li>– Excellent proposal, with high degree of innovation.</li> <li>– Capable of making a real contribution to the field.</li> <li>– Likely to attract wider attention, such as publication in high quality journals.</li> <li>– Well researched and related to future aims.</li> </ul>	<ul style="list-style-type: none"> <li>– Very clear reasons for selecting the proposed course based on extensive research and well justified.</li> <li>– Consideration given to specific options and dissertation topics, where appropriate.</li> <li>– Possibility of original work emerging, which might attract wider attention.</li> <li>– Convincing attempt to set the course choice in the context of future career activity.</li> </ul>	<ul style="list-style-type: none"> <li>– Very strong evidence that proposed work accords with national and/or DFID priorities for development of the home country and will contribute to capacity building.</li> <li>– Skills acquired will be fundamentally important to development</li> <li>– Very strong evidence of personal commitment to development of home country expressed through past activities and convincing future plans.</li> <li>– Very clear linkage of past and future development related activities with content of proposed study.</li> </ul>
A High	<ul style="list-style-type: none"> <li>– Extremely good candidate</li> <li>– Likely to be in top 15-30% of UK postgraduate cohort.</li> </ul>	<ul style="list-style-type: none"> <li>– Extremely good proposal, well thought out in all respects, and all key points covered.</li> <li>– Area of research justified, and related to future aims.</li> <li>– Some prospect that work will attract wider attention.</li> </ul>	<ul style="list-style-type: none"> <li>– Evidence that the candidate has chosen the course for sound reasons, and given some consideration to detailed content.</li> <li>– Clearly and convincingly expressed.</li> </ul>	<ul style="list-style-type: none"> <li>– Proposed course of study is clearly relevant to development objectives and will provide important skills to enable these.</li> <li>– Some evidence that this will be applied to the home country needs.</li> <li>– Some evidence of previous personal commitment and clear future plans</li> </ul>
A Standard	<ul style="list-style-type: none"> <li>– Above average candidate by UK postgraduate standards.</li> <li>– Likely to be in top 50% of UK cohort.</li> </ul>	<ul style="list-style-type: none"> <li>– Competent proposal, showing attention to all key areas.</li> <li>– Appears viable and realistic.</li> </ul>	<ul style="list-style-type: none"> <li>– An informed choice of course of study with benefits clearly laid out.</li> </ul>	<ul style="list-style-type: none"> <li>– Proposed course of study has some relevance to home country needs and is likely to produce skills relevant to development.</li> <li>– Some evidence that the candidate has specifically linked the course of study to development needs and will apply knowledge and skills gained to home country.</li> </ul>
B	<ul style="list-style-type: none"> <li>– Acceptable candidate, capable of gaining admission to a high quality course and completing successfully.</li> </ul>	<ul style="list-style-type: none"> <li>– Acceptable proposal, lacking in some areas, but capable of being rectified with suitable supervision.</li> </ul>	<ul style="list-style-type: none"> <li>– Acceptable study plan, possibly with some gaps and minor inaccuracies, but suggesting that the candidate has understood enough about the course to benefit from it.</li> </ul>	<ul style="list-style-type: none"> <li>– Course of study has relatively little direct relevance to home country needs but will provide generic skills.</li> <li>– Candidate is likely to use these skills for the benefit of home country.</li> </ul>
C	<ul style="list-style-type: none"> <li>– Unacceptable candidate, with a serious risk of not gaining admission, or not being able to cope with course of study proposed.</li> </ul>	<ul style="list-style-type: none"> <li>– Unacceptable proposal, showing serious weakness that might prevent completion of the proposed study.</li> </ul>	<ul style="list-style-type: none"> <li>– Unacceptable study plan, showing serious weaknesses or inaccuracies that suggest that the candidate has made no attempt to identify appropriate courses and institution or has provided no justification for choices given.</li> </ul>	<ul style="list-style-type: none"> <li>– Serious concern that the candidate is not likely to apply the results of the course for wider benefit—for example by not returning to the home country, or placing undue emphasis on private gain only.</li> </ul>

## FCO AWARDS

<i>Grade</i>	<i>Academic Merit</i>	<i>Quality of Study Plans (Doctoral)</i>	<i>Quality of Study Plans (Masters)</i>	<i>Leadership Potential (FCO Candidates)</i>
Factors taken into account	<ul style="list-style-type: none"> <li>– Examination results.</li> <li>– Academic transcripts.</li> <li>– Tutors and referees' reports.</li> <li>– Any academic prizes.</li> <li>– Other relevant activities.</li> <li>– Publications, where appropriate.</li> </ul>	<ul style="list-style-type: none"> <li>– Extent to which the work programme has been well researched and thought out.</li> <li>– Degree of innovation.</li> <li>– Likely impact.</li> <li>– Clarity.</li> <li>– Relevance to field.</li> <li>– Relevance for future career.</li> <li>– Feasibility</li> </ul>	<ul style="list-style-type: none"> <li>– Extent to which the proposed course of study has been well researched (including specific options and dissertation topics, where appropriate) and presented.</li> <li>– Extent to which choice fits well with the strengths and possible future career of the candidate.</li> </ul>	<ul style="list-style-type: none"> <li>– Extent to which the candidate appears motivated and able to assume leadership roles, and become involved in wider society or professional affairs.</li> <li>– Evidence might include extra curricular activity, paid or voluntary work experience and range of interests or ambitions expressed in supporting letter</li> </ul>
A Plus	<ul style="list-style-type: none"> <li>– Outstanding past performance.</li> <li>– Likely to be in top 5% of UK postgraduate cohort.</li> </ul>	<ul style="list-style-type: none"> <li>– Excellent proposal, with high degree of innovation.</li> <li>– Capable of making a real contribution to the field.</li> <li>– Likely to attract wider attention, such as publication in high quality journals.</li> <li>– Well researched and related to future aims.</li> </ul>	<ul style="list-style-type: none"> <li>– Very clear reasons for selecting the proposed course, based on extensive research and well justified.</li> <li>– Consideration given to specific options and dissertation topics, where appropriate.</li> <li>– Possibility of original work emerging, which might attract wider attention.</li> <li>– Convincing attempt to set the course choice in the context of future career activity.</li> </ul>	<ul style="list-style-type: none"> <li>– Very strong evidence to suggest that the candidate has the personality and ambition to assume senior level responsibility in a future career, and make a strong contribution to wider society.</li> <li>– This could be seen in strong extra curricular activity—maybe at national or regional level, or exceptional strength of character in other areas—such as overcoming adversity.</li> <li>– Candidate has presented a very strong argument relating proposed course of studies to their future contribution to society</li> </ul>
A High	<ul style="list-style-type: none"> <li>– Extremely good candidate</li> <li>– Likely to be in top 5-15% of UK postgraduate cohort.</li> </ul>	<ul style="list-style-type: none"> <li>– Extremely good proposal, well thought out in all respects, and all key points covered.</li> <li>– Area of research justified, and related to future aims.</li> <li>– Some prospect that work will attract wider attention.</li> </ul>	<ul style="list-style-type: none"> <li>– Evidence that the candidate has chosen the course for sound reasons, and given some consideration to detailed content.</li> <li>– Clearly and convincingly expressed.</li> </ul>	<ul style="list-style-type: none"> <li>– Clear evidence that the candidate takes on leadership in a range of external activities, at least at local or university level. Some interest in wider society / ethical issues.</li> <li>– Relatively wide-ranging extra curricular activities.</li> <li>– Candidate has presented a convincing argument relating proposed course of study to their future contribution to society.</li> </ul>
A Standard	<ul style="list-style-type: none"> <li>– Well above average candidate by UK postgraduate standards.</li> <li>– Likely to be in top 15–30% of UK cohort.</li> </ul>	<ul style="list-style-type: none"> <li>– Competent proposal, showing attention to all key areas.</li> <li>– Appears viable and realistic.</li> </ul>	<ul style="list-style-type: none"> <li>– An informed choice of course of study with benefits clearly laid out.</li> </ul>	<ul style="list-style-type: none"> <li>– Some evidence that candidate takes on leadership, is involved in extra-curricular activities and is likely to make a contribution to society.</li> </ul>
B	<ul style="list-style-type: none"> <li>– Acceptable candidate, capable of gaining admission to a high quality course and completing successfully.</li> </ul>	<ul style="list-style-type: none"> <li>– Acceptable proposal, lacking in some areas, but capable of being rectified with suitable supervision.</li> </ul>	<ul style="list-style-type: none"> <li>– Acceptable study plan, possibly with some gaps and minor inaccuracies, but suggesting that the candidate has understood enough about the course to benefit from it.</li> </ul>	<ul style="list-style-type: none"> <li>– Basic evidence of ability to take responsibility in some form, and/or some external interests.</li> <li>– Candidate at least appears reasonably confident, articulate and ambitious.</li> </ul>

<i>Grade</i>	<i>Academic Merit</i>	<i>Quality of Study Plans (Doctoral)</i>	<i>Quality of Study Plans (Masters)</i>	<i>Leadership Potential (FCO Candidates)</i>
C	– Unacceptable candidate, with a serious risk of not gaining admission, or not being able to cope with course of study proposed.	– Unacceptable proposal, showing serious weakness that might prevent completion of the proposed study.	– Unacceptable study plan, showing serious weaknesses or inaccuracies that suggest that the candidate has made no attempt to identify appropriate courses and institution or has provided no justification for choices given.	– Serious concern that the candidate lacks the personal strength or, confidence to complete the course, or effectively apply the skills gained in any future career.

## APPENDIX 85

### Supplementary evidence from the Department for International Development

#### *Annex A:*

Follow-up to question 8, following oral evidence session on 12 January 2004.

#### *Annex B:*

Response to points made by Professor Pickett relating to African witch weed (*Striga*) (oral evidence session on 15 March 2004).

#### *Annex C:*

Response to oral question on Chevening scholarship raised at the evidence session with FCO on 26 April.

#### *Annex D:*

Reply to the House of Commons Science and Technology Committee following oral evidence session on 26 May 2004.

July 2004

**Annex A**

### FOLLOW-UP TO QUESTION 8, FOLLOWING ORAL EVIDENCE ON 12 JANUARY 2004

#### *Question 8*

Witnesses undertook to provide further statistics on the number and proportion of research projects which DFID has contracted to British and British-led groups. It would be helpful to have these figures for each of the last five years.

#### *Answer 8*

- The proportion of British and British-led groups winning contracts from DFID’s central research programmes has remained high, at approximately 72% of contracts issued, since the 2002 International Development Act was introduced. This has been a decrease of less than 15% since the introduction of the act, much of which is accounted for by the move towards developing country-led contracts. For further detail on these figures please see Table 1 below. Table 2 is provided to show overall value of Centrally funded research, which sets the data in context.
- DFID’s research programme is “untied”, with no preference to British suppliers, in line with the International Development Act 2002 which lays down that assistance provided primarily for purposes other than funding sustainable development or promoting the welfare of people is not permissible even where poverty reduction is a secondary effect. So a policy of Aid Tying—where

the primary purpose is to gain contracts for UK suppliers—would be unlawful. However, many British research institutions are the best in the world and win open competitions for DFID (and other) funding, as can be seen in the table below.

Table 1

THE NUMBER AND PROPORTION OF DFID RESEARCH PROJECTS CONTRACTED TO BRITISH-LED GROUPS FROM FY 1999–2004

Research Area	1999–2000			2000–01			2001–02			2002–03			2003–04		
	No of contracts	UK led	% of total	No of contracts	UK led	% of total	No of contracts	UK led	% of total	No of contracts	UK led	% of total	No of contracts	UK led	% of total
1. Health	19	19	100	12	12	100	11	10	91	6	6	100	1	1	100
2. Engineering	42	42	100	59	57	96	70	67	95	34	33	97	18	17	94
3. Renewable Natural Resources	152	132	87	100	74	74	54	28	52	78	40	51	33	18	54
4. Economic/Social/Political science	10	10	100	100	98	98	36	36	100	38	33	86	14	12	85
5. Education	2	2	100	23	23	100	11	10	90	1	1	100	3	2	66

Table 2

TOTAL CENTRAL RESEARCH SPEND BY FINANCIAL YEAR  
(NB: Does not include research spend by DFID country offices or scholarship schemes)

	1999–2000	2000–01	2001–02	2002–03	2003–04
Total Central Research Spend (£ million)	75.86	71.0	78.0	84.6	85.4

Table notes

(a) The data is based on new contracts entered into, and not existing contracts, as this provides a better indication of trends.

(b) The following factors provide the context to decreases in the numbers of contracts awarded:

- 2003–04: This was a transitional year, pending the new DFID research strategy, therefore fewer new contracts were issued. Total research spend was in fact increased in this year, in part from extending existing contracts.
- Health: DFID moved away from a project award scheme, which was management intensive, to fewer but financially larger and longer-term (five-year) knowledge programmes at the end of 1999.
- Engineering: The large increase in numbers of contracts between 1999–2002 was part of a funding strategy to increase research on engineering issues. Projects funded in 2002 were for an average four-year period and brought the project funding cycle together. Consequently, the engineering budget was heavily committed for the next four years, hence the drop in contracts issued in 2002–03.
- Renewable Natural Resources (RNR): DFID has 10 centrally-funded RNR research programme management contracts, all led by UK institutions. Figures in the table are of new projects commissioned by these programmes. The programmes are designed to deliver their objectives over a 10-year period originally ending in 2005 and now being extended to 2006. As the programmes near their completion, more emphasis is being placed on promoting the knowledge they have generated with relatively less on the commissioning of new projects. The data also indicate a shift away from UK-led towards developing country-led projects.
- Economic, Social and Political Science (ESPS): At the end of the financial year 1998–99 the ESPS budget was fully committed so very few contracts were issued in 1999–2000. In 2001 DFID moved away from funding a large number of projects towards funding fewer but financially larger Development Research Centres. This followed the recommendations of the Harvard Review and provided longer-term support to theme-based programmes of work. They reflect DFID's interests in supporting Southern research capacity and a much stronger articulation between research and policy processes.
- Education: Following a round of commissioning in 2000–01 there was a cyclical decline in new contracts issued. The next funding round in Education research will be agreed in 2004, following publication of the new DFID research strategy.

(c) The data relates to a financial year, 1 April–31 March.

**Response to points made by Professor Pickett relating to African Witch Weed (*Striga*):**

- Summary of a detailed response, passed to DFID by DFID's Crop Protection Research Programme Manager, Dr Frances Kimmins, to factually incorrect evidence submitted orally to the STC by Professor Pickett at the evidence session on Monday 15 March 2004.
- The Crop Protection Programme response is at Annex 1 below.

**Professor Pickett:** On the crop protection side, the fact is that our money from DFID has also diminished, but I do not think we are really making a plea on that score. We are getting it from other agencies. The main thing is the frustration that the science base which is there is not being used [by DFID], and not even being recognised. That has led to various issues which we would strongly disagree with, the use of inappropriate biological agents [in DFID's Crop Protection Programme].

**Q192 Mr McWalter:** Such as?

**Professor Pickett:** *Bacillus thuringiensis endotoxins* are actually against lepidopterous insects and to some extent certain flies, but not the kind of insects being used in programmes that we have seen.

- DFID Response: DFID's Crop Protection Research Programme does not use or fund work on *Bacillus thuringiensis* (Bt) technology.

**Professor Pickett:** We have seen against the fact that already a lot of resource has been put into social sciences issues where fallowing has been used to try and control weeds particularly in Africa, the African witch weed, and if you look at the economics on the ground, people really cannot afford to have this piece of land out of production for a season, or even two seasons, the two rainy seasons that occur in the year, and even the crops that have been grown do not have any value in themselves. . . .

- DFID Response: Fallowing, in the sense of leaving land uncultivated, has not been recommended as a *Striga* (African Witch Weed) control strategy. Rotation of food crops with green manures for soil enrichment and *Striga* suppression has been researched and widely taken up by farmers. Increased land productivity and reduced labour demand in subsequent crops more than compensate for the so-called "unproductive period".

**Professor Pickett:** . . . and where the African people have tried to make value by eating them under slightly strange circumstances, the crops themselves are not really appropriate for that purpose.

- DFID Response: Some recommended green manures provide additional direct economic benefits in the form of food for human consumption (pigeon pea) and livestock feed (*Crotalaria ochroleuca*).

**Professor Pickett:** All this stems from a lack of scientific, measured advice and involvement within the system . . .

- DFID Response: Farmers, especially those farming at the margins of economic viability, follow very diverse livelihood strategies. Social science inputs have been fundamental in understanding the feasibility of possible *Striga* control methods at farm level and in supporting farmer evaluation and adaptation of promising technologies. Over the past decade DFID (and other development agencies) have found that top-down application of technology by scientists has repeatedly led to rejection by farmers because they are inappropriate under smallholder farming constraints and conditions.

**Professor Pickett:** . . . But I think the idea of tapping the world's scientific resources when we are not tapping those in the UK is very sad, because just giving the money to CGIR does not mean to say you are tapping the best of the world's resources; they have their own problems in terms of their priorities, where they see their priorities and what they actually do with the science base that they can take.

- DFID Response: DFID has funded an extensive *Striga* research programme (nine projects since 1990, four on-going). *Scientists from 8 UK institutions have had significant inputs* (three BBSRC institutes, Universities of York, Manchester, Sheffield, University College London, and NRI).

**Science and Technology Committee Third Evidence Session****"THE USE OF SCIENCE IN UK INTERNATIONAL DEVELOPMENT POLICY"  
MONDAY 15 MARCH 2004**

1. At the above meeting Prof John Pickett (Rothamsted Research, representing BBSRC) made the following comments:

"On the crop protection side, the fact is that our money from DFID has also diminished, but I do not think we are really making a plea on that score. We are getting it from other agencies. The main thing is the frustration that the science base which is there is not being used, and not even recognised. That has led to various issues which we would strongly disagree with, the use of inappropriate biological agents."

*Mr Mc Walter:* “Such as?”

PP: “*Bacillus thuringiensis* endotoxins are actually against lepidopterous insects and to some extent certain flies, but not the kind of insects being used in programmes that we have seen. We have seen against the fact that already a lot of resource has been put into social sciences issues where fallowing has been used to try and control weeds particularly in Africa, the African witch weed, and if you look at the economics on the ground, people really cannot afford to have this piece of land out of production for a season, or even two seasons, the two rainy seasons that occur in the year, and even the crops that have been grown do not have any value in themselves, and where the African people have tried to make value by eating them under slightly strange circumstances, the crops themselves are not really appropriate for that purpose. All this stems from a lack of scientific, measured advice and involvement within the system. But I think the idea of tapping the world’s scientific resources when we are not tapping those in the UK is very sad, because just giving the money to CGIR does not mean to say you are tapping the best of the world’s resources; they have their own problems in terms of their priorities, where they see their priorities and what they actually do with the science base that they can take.

2. As the crop protection sector was specifically mentioned in Professor Pickett’s evidence we feel it is important that the DFID Crop Protection Programme (CPP) addresses the misconceptions presented to the Science and Technology Committee on the 15 March. The main thrusts of his argument appear to be:

- Funding of inappropriate research activities by DFID in the crop protection sector.
- UK science base not being recognised or used sufficiently to address issues faced by poor farmers.
- Too many resources being placed into social science.

The supplementary evidence presented here by the DFID CPP will demonstrate the value of both the UK science base in one of the specific areas mentioned in Professor Pickett’s evidence and the necessity of linking natural and social sciences in development research.

3. Firstly to set the record straight, if by “crop protection side” Professor Pickett means the DFID CPP, then the programme has not funded work on Bt endotoxins so the CPP management and advisors are unable to comment on what he sees as failings on the part of DFID in this area of research. The reality of DFID support for *Striga* research, however, is somewhat different and indeed DFID should be applauded for the consistent level of investment they have made over the past 10 to 15 years on research to combat this very widespread and serious problem. In doing this DFID has made very full and widespread use of the UK science resource base, including funding projects at Professor Pickett’s own institute when this was the Institute of Arable Crops Research. Furthermore there has been a necessary and successful partnership between natural and social science. What is at issue here is NOT what has gone before BUT concerns that DFID may not continue to provide adequate funding in the future for R&D work on *Striga* in order to capitalise upon, and add value to previous investments.

#### BACKGROUND TO DFID CPP *STRIGA* RESEARCH AND NECESSITY TO INTEGRATE NATURAL AND SOCIAL SCIENCE TO COMBAT THIS PROBLEM

4. *Striga* species, the so-called witchweeds, are widespread on the fields of small holder farmers in semi-arid areas of sub-Saharan Africa. These noxious parasitic weeds principally attack and reduce the yield of staple cereals and legumes ie finger millet, pearl millet, maize, sorghum, upland rice and cowpeas in these regions. In many areas it is the crops of resource-poor households which are affected by these weeds. They impose an additional stress with which people, who have little capacity for investment in crop production, have to cope in an environment characterised by marginal rainfall for cropping and declining soil fertility. It is now widely recognised that farmers in these regions have to follow diversified livelihoods to make ends meet and in their fields are often farming at the margins of economic viability. Social science inputs have therefore been absolutely fundamental for unravelling our understanding of what may be possible in *Striga* management and in supporting farmer evaluation of technologies. A number of DFID projects have combined upstream science in UK universities, to understand *Striga*/host crop interactions, with farmer participatory studies in farming communities in Africa, in collaboration with NARS and national university staff. The achievements speak for themselves and provide an excellent advertisement of what can be achieved through careful building of research partnerships with DFID support.

#### INVOLVEMENT OF THE UK SCIENCE BASE IN *STRIGA* RESEARCH

5. The table at the end of the narrative illustrates the exploitation of the UK resource base over the past 15 years under both the DFID Integrated Pest Management Strategy Area and since 1995, the Crop Protection Programme. This clearly demonstrates the commitment of the current DFID Crop Protection Programme to work on this widespread constraint to small holder cereal and legume productivity in sub Saharan Africa and the breadth of appropriate outputs that could be subject of future funding.



## INAPPROPRIATE FALLOWING

6. Professor Pickett specifically referred to the inappropriateness of fallowing. The target of his comment is not completely clear. No one with DFID CPP funding has been, or is currently evaluating the use of fallows in the usual understanding of the term ie leaving land uncropped. DFID CPP work in Tanzania has, however, demonstrated that rotation of rice on *Striga* infested fields with either the green manure, *Crotalaria ochroleuca*, or the legume crop, pigeon pea, leads to a reduction in the *Striga* problem, increases soil fertility and increases crop yield (R 8914). Farmers have found this to be a low input, economic and sustainable practice and in Kyela farmers have adopted the practice. A CPP management team witnessed, first hand, the farmers enthusiasm for this rotation practice in upland rice systems of Tanzania (week beginning 22 March 2004). The attached photo shows a farmers' trial plot. The rice on the left of the picture was planted in a plot where green manure was incorporated last season; the control plot on the right was untreated. The differences in the colour of the crops is immediately noticeable and farmers have previously reported significant yield increases between the trial and control crops.

7. The prospects for scaling up are promising especially as new communication initiatives will be available in Tanzania to ensure that farmers can access information on green manures and their alternative uses. Additionally the CPP project leader in Tanzania, Dr Mbwaga, a *Striga* specialist, is in discussions with the Tanzanian Ministry of Agriculture to scale up the DFID research findings for other upland rice areas.

8. A second CPP project (R 8215) which is promoting low input strategies for controlling *Striga* on lowland maize has evaluated green manures with farmers in another area of Tanzania (Tanga). In this location *Crotalaria* known as marejea, is not preferred in some villages but is rated highly by others. A third CPP project focussing on sorghum (R 7564) has identified two *Striga* tolerant varieties known as Hakika ("be sure"), that is farmers are sure of a harvest from *Striga* infested fields) and Wahi ("early"). These mature early and have good drought tolerance, good grain quality and taste. The lines are popular with farmers have been approved for release by the Tanzanian seed registration authority.

9. The results from these projects highlight the lessons learnt from DFID *Striga* research:

- The need for robust validated location and crop specific adaptive research.
- The importance of providing farmers with a voice in the evaluation of research findings.
- The need to deploy natural science and social science in tandem to identify appropriate technologies that are acceptable to farmers.

ADDITIONAL INFORMATION ON THE TOXICITY OF *CROTALARIA*

10. Since the committee hearing we understand Professor Pickett has expressed his concerns that the *Crotalaria* species are toxic to livestock. There is indeed an extremely rich and well known literature on intoxication of horses, the bovine, donkey, and wild buck by a range of *Crotalaria* species in East and Southern Africa—see the extensive account in Watt and Breyer-Brandwijks' book "Medicinal and Poisonous Plants of Southern Africa" 1962 E & S Livingstone Publishers. pp 577–588. As with many legume genera *Crotalaria* is rich in alkaloids. The most well known problems occur in *C burkeana* which causes so called "*crotalariosis*" on cattle in southern Africa. Another species implicated in southern Africa is *C dura*. The most well known of the green manure species, used for decades in the region is of course sunnhemp or *C juncea*. Work many years ago in what was Rhodesia at the time indicated that if the plant is cut and made into hay at early flowering stage it produces no ill effects in cattle or sheep. In feeding trials sheep had no ill effects from being fed 0.25 pound of seed a day for 14 days but did suffer from greater quantities. The plant may also be dangerous for horses.

11. We understand that there is next to no information in the literature on possible toxicity from marejea, or *C ochroleuca*, the species used by the CPP project in Tanzania. We attach and abstract of a thesis from SUA, suggesting that there may be problems in rabbits above a certain proportion of diet. However you will also see the promotional information taken from a leaflet prepared by the Peramiho Mission in Tanzania. This was the CPP project's source of seed. You will see that the mission indicates the plants can be used as livestock feed. Further more toxicity has not been seen as an issue by many other internationally reputed institutions which are promoting the use of marejea in Africa. We refer you to CIAT for example who have an informative leaflet on this—[www.ciat.cgiar.org/downloads/pdf/leaflet\\_crotalaria.pdf](http://www.ciat.cgiar.org/downloads/pdf/leaflet_crotalaria.pdf)

12. In the CPP projects in Tanzania, marejea is promoted as a green manure for ploughing under and not as a livestock feed. The issue of toxicity should, of course, be considered but from our understanding it is not significant for *C ochroleuca*. Wild *Crotalaria* species are abundant around the fields in our trial sites in Kyela, as in many parts of East Africa, and farmers have not pointed these out as an issue. We can certainly ask about this at our next farmer group meetings. At the time *Crotalaria* is growing in rice fields cattle and smallstock are herded anyway. Horses are unknown and project leaders can not recall ever seeing a donkey in the area. Pigs remain around houses.

13. Promotion work funded by the DFID CPP will continue in Tanzania on upland rice and lowland maize with DFID support until the end of the current DFID research strategy in March 2005 (now likely to be April 2006). The support provided by DFID in recent years for work on *Striga* is excellent evidence of the value on using the depth of science expertise for overseas agriculture which has been available in UK

universities and BBSRC. We would encourage DFID to continue to support this resource which has the potential to build on previous achievements with overseas partners for the benefit of the rural poor in marginal farming areas of Africa.

*Dr C Riches*

Agronomist/Weed Scientist Natural Resources Institute, University of Greenwich

*Dr F Kimmins*

Crop Protection Programme Manager, NR International, Aylesford, Kent

2 April 2004

## THESIS FROM SUA

### 8. EVALUATION OF CROTALARIA OCHROLEUCA ("MAREJEA") AS A PROTEIN SUPPLEMENT FOR RABBITS

*Lugembe, KKM, MSc (Agric) 1996*

*Supervisors: Dr G H Laswai and Prof R D Masha*

The nutritive value and toxic effects of *C ochroleuca* on rabbit performance were evaluated in this study. The digestibility, nitrogen retention and toxic effect of diets, in which *C ochroleuca* substituted sunflower seed cake (SSC), at rates of 0, 15, 30 and 45% in treatments A, B, C and D, respectively, were estimated. Twenty four rabbits were used in a completely randomized design. In another experiment 32 equal number of male and female rabbits were randomly allocated in the four dietary treatments, in a completely randomized block design. Feed intake, growth performance and slaughter characteristics were evaluated. Increasing the level of *C ochroleuca* meal in the diet, from 0% to 45% significantly ( $P < 0.05$ ) increased dry matter digestibility (DMD) of the diets from 57.8 to 70.4%DM. The mean nitrogen retention values were 0.93, 0.93, 1.04 and 0.94 for treatments A, B, C and D, respectively, and the mean difference between treatments was not significant ( $P > 0.05$ ). Inclusion of *C ochroleuca* in the diets did not show clinical toxic effects on the animals. Slight increases of Glutamic pyruvate transaminase (GPT/GGT), Glutamic-oxaloacetic transaminase (GOT) and white blood cells (WBC) were noted with increasing level of inclusion of *C ochroleuca*. Animals on Treatment C showed significantly ( $P < 0.05$ ) higher live weights compared to those on the other treatments. Mean growth rate was, however, not significantly ( $P > 0.05$ ) influenced by the dietary treatments. feed dry matter intake (DMI) and the average FCR (g DMI/g LW gain) were not significantly ( $P > 0.05$ ) influenced by the dietary treatments. However, animals on Treatments C had the highest intake (85.7 g/day). The average slaughter weight was significantly ( $P < 0.05$ ) lower for animals on Treatment D compared with those on the other treatments. The weight of the non carcass components (except the head) were not significantly ( $P > 0.05$ ) affected by dietary treatments. The overall results indicated that *C ochroleuca* meal can be included in rabbit diets up to 45% to improve intake, digestibility and growth performance. The observed lesions, changes of blood and enzymatic parameters suggests early signs of toxicity and calls for a longer period and detailed toxicity study.

## TRANSCRIPT OF LEAFLET FROM PERAMIHO MISSION IN TANZANIA

### A POPULAR MULTIPURPOSE GREEN MANURE IN TANZANIA

*Crotalaria ochroleuca*, an annual legume from Africa commonly known as marejea, or sunnhemp, has emerged as a promising underexploited crop. Vol 3 No 1 of the ILEIA Newsletter reported on this promising legume. Recently, Father Gerold, a Benedictine missionary in Tanzania published a manual on Sunnhemp, called Sunnhemp/Marejea, which covers the many beneficial characteristics of this plant.

Among sunnhemp's many uses are the following: green manure, nitrogen fixation, weed suppression, livestock forage, and pest control. Farmers in Tanzania have found tillage easier in fields where sunnhemp has been grown and incorporated into the soil, due to improved soil texture. These farmers can plow their fields before the rains, giving crops the benefit of the full rainy season, improving their chances of a successful harvest. Sunnhemp's deep root system aerates the soil and increases water infiltration. The deep roots also retard soil erosion.

Nitrogen fixing rhizobium associated with these roots, fix atmospheric nitrogen normally unavailable to plants. Professor M P Salema of Sokoine University of Agriculture, Morogoro, has isolated superior kinds of rhizobium for improved nodulation on sunnhemp. By inoculating their seeds with the rhizobium farmers can now increase their production.

Nitrogen that has been fixed by the soil rhizobium is made available to crops by composting sunnhemp or turning it into the soil in situ. The organic matter added to the soil also improves soil moisture retention and texture. Cut sunnhemp can be used as a mulch to suppress weed growth and to control erosion. Ultimately the sunnhemp mulch will decompose, adding nitrogen to the soil to benefit succeeding crops. Sunnhemp's low carbon to nitrogen ratio causes it to decompose readily, quickly adding nutrients to the soil. Sunnhemp, unlike most nitrogen fixing legumes, performs well on poor and acidic soils. For this reason farmers in Tanzania have used sunnhemp to revitalize weedy or infertile fields.

In addition to its soil improving qualities, sunnhemp also controls weeds. Under appropriate conditions sunnhemp establishes quickly and grows abundantly, thus out competing weeds. If planted densely, sunnhemp prevents weed growth in the first year, and reduces subsequent weed growth for the following one to three years. Sunnhemp can out compete couch grass (*Digitaria sp*) but not blackjack (*Bidens pilosa*). Over the course of three years sunnhemp eventually out competes stargrass (*Cynodon sp*) in paddies.

The same rapid, abundant growth that out competes weeds also controls erosion. Planting sunnhemp between crops, both spatially and temporally, maintains a continuous plant cover which stabilizes the soil and breaks the impact of rain drops. Since sunnhemp is drought tolerant, it is able to protect the soil when rains begin again.

#### CULTIVATION OF SUNNHEMP

Experienced sunnhemp farmers mix 10kg of seed for each 0.5 hectare to be planted with sand or dry soil at the ratio of 1:2 litres to assure a proper planting density (plants spaced 10–15cm apart). Above ground growth is slow initially, as the plants develop deep roots. Eventually sunnhemp reaches a height of two metres or more, and flowers appear three or four months later. Sunnhemp does not re-seed itself, since its pods stay closed after the seeds have matured, even protecting them for months into the rainy season. After six months the plants begin to senesce. The stems, however may persist for as long as eight or nine months, and will develop new leaves when cut one foot above ground, or when eaten by animals.

#### OTHER USES OF SUNNHEMP

Sunnhemp can be grown as a fodder crop. Farmers in Tanzania have found that sunnhemp can constitute 60% of their cattle's feed. The stems that are left over are mixed with manure to compost them. Chicken will eat any part of the sunnhemp plant except for the seeds. One acre can yield up to 100 to 300 kilos of seeds; one kilo seed sells at 25/shillings in Tanzania. Some farmers let their cattle graze sunnhemp for one hour a day if they do not want to harvest the seed. Sunnhemp can also be used to feed tilapia.

According to farmers' observations, sunnhemp controls nematodes which attack tomatoes. Farmers plant sunnhemp about four months before planting the tomatoes. Cut the sunnhemp and dig it in to the soil one month before planting the tomatoes or when the sunnhemp is about one metre high. Sunnhemp also hosts a beneficial insect, the earwig. Earwigs enter stem borer tunnels in search of larvae. Occasionally they climb the foliage to prey on leafhopper larvae. Earwigs can consume 20–30 prey daily, and live three to five months. Farmers in Tanzania have noticed few harmful insects in fields where sunnhemp is intercropped with maize.

Farmers in Tanzania have discovered several successful management techniques for growing sunnhemp in association with their food crops. Some farmers plant single stands of sunnhemp before and after maize when chemical fertilizer is unobtainable. Although an extra ploughing is required to plant the sunnhemp, weeding is reduced, and maize yields are higher. Other farmers sow sunnhemp along with maize, and incorporate it into the soil when it nears the height of the maize.

Farmers who rotate sunnhemp with maize or sorghum plough the sunnhemp under at flowering. At this stage the sunnhemp has accumulated near to maximum amounts of nitrogen, and the biomass is still succulent enough for fast decomposition and release of nutrients. In very poor soils sunnhemp improves soil fertility most when the mature plant, including the seeds, are incorporated into the soil.

Sunnhemp can also be used in a rotational planting schedule along with rice and beans. Sunnhemp is planted in the rice fields at the time of the first rice weeding. The sunnhemp is still short when the rice is ready for harvest. After harvesting the rice, sunnhemp covers the field, and is plowed in before planting beans. Farmers in Tanzania have found this method quite effective in controlling weeds. A later issue will feature a community where Sunnhemp is used as a fertilizer, and its seeds are valued as a cash crop.

*STRIGA* MANAGEMENT RESEARCH FUNDED BY ODA/DFID 1990–2005

<i>Project Themes</i>	<i>UK science input</i>	<i>Partnerships</i>	<i>Outputs</i>
Understanding <i>Striga</i> /host plant interactions	University College London University of York University of Manchester	Included CIMMYT, Kenya; IITA in West Africa	Provided a greater understanding of how <i>Striga</i> impacts on growth and yield of host plants and provided targets for development of control measures
Developing cowpeas resistant to <i>Striga</i>	IACR Long Ashton (BBSRC)	IITA, NARS in Kenya, Tanzania	Developed screening systems, characterised resistance. Varieties based on this resistance were bred by IITA and now released and used by farmers in West Africa (Nigeria, Niger, Bukina Faso).
Developing rice varieties resistant to <i>Striga</i>	Natural Resources Institute IACR Long Ashton (BBSRC)	West Africa Rice Development Association NARS, Tanzania	Sources of resistance selected, new varieties developed by WARDA and made available for testing by NARS in West and East Africa.
Management strategies for <i>Striga</i> in sorghum and maize in East Africa	Natural Resources Institute University of Sheffield IACR Long Ashton (BBSRC)	NARS Tanzania Sokoine University, Tanzania	Two <i>Striga</i> tolerant varieties of sorghum selected through work with farmers, now registered. Being promoted to farmers in Tanzania with funds from USAID, and DFID. Currently insufficient seed to satisfy farmer demand. Sources of tolerance to <i>Striga</i> in maize identified and evaluated with farmers.
Biocontrol of <i>Striga</i> in millet and sorghum	Natural Resources Institute	NARS Mali	Models indicated biocontrol approach using insects not efficient.
Management of <i>Striga</i> in rice by improving soil fertility	Natural Resources Institute	NARS Tanzania Sokoine University, Tanzania INADES Tanzania (NGO)	Development and promotion of use of green manure or pigeon pea in rotation with rice. This organic approach to soil fertility enhancement reduces the impact of <i>Striga</i> and raises crop yields by 60% or more. Evaluated by farmers, found to be low cost and sustainable. Being adopted in two areas of Tanzania.
Management of <i>Striga</i> in maize by improving soil fertility	Silsoe Research Institute (BBSRC) Natural Resources Institute	NARS Tanzania Sokoine University, Tanzania INADES Tanzania (NGO)	Currently demonstration use of green manures in rotation with maize and use of two <i>Striga</i> tolerant maize varieties in farming communities.
Enhancing communication of research results to farmers	Natural Resources Institute	NARS Tanzania Sokoine University, Tanzania INADES Tanzania (NGO)	Pilot project to develop mechanisms and learn lessons on improved information flow—includes promotion of <i>Striga</i> management practices in three districts. Outputs of potential use to up-coming World Bank Agricultural Sector Development Programme in Tanzania.
Trap and barrier crops for management of <i>Striga</i> and stem borer in maize	Rothamsted Research (BBSRC)	International Centre for Insect Physiology and Ecology (Kenya) NARS in East Africa	Currently evaluating a novel management approach involving the use of a fodder legume inter-cropped with maize. This appears to reduce impact of <i>Striga</i> on the crop and may be appropriate for livestock farmers.

## Annex C

## DFID RESPONSE TO ORAL QUESTION ON CHEVENING SCHOLARSHIP RAISED AT THE EVIDENCE SESSION WITH FCO ON 26 APRIL

In 1998–99, DFID made the decision to transfer the resources used to support the British Council core grant and the Chevening Scholarship programme to the FCO. This decision was taken on value for money grounds in order to avoid duplication of core funding between government departments, and to enable DFID to prioritise the primary education sector.

However, DFID has continued to provide support to tertiary education through the Commonwealth Scholarship and Fellowship Plan (CSFP), and the DFID Shared Scholarship Scheme (SSS). DFID support to the Commonwealth Scholarship and Fellowship Plan is planned to rise from £11.7 million in 2004–05, to £12 million in both 2005–06 and 2006–07. The DFID Shared Scholarship Scheme (which is jointly funded by DFID and UK Universities) also makes awards in science. DFID has contributed £2 million each year to this programme for several years. Other donors also provide support to the secondary and tertiary education sectors.

## Annex D

## DFID REPLY TO THE HOUSE OF COMMONS SCIENCE AND TECHNOLOGY COMMITTEE FOLLOWING ORAL EVIDENCE ON 26 MAY 2004

1. *What formal mechanisms does DFID use to help developing countries to identify their scientific and technological requirements and to incorporate these into their Poverty Reduction Strategies and national science, technology and innovation strategies?*

- Dialogue with Governments over Poverty Reduction Strategies is a top priority for relevant DFID country offices. Science and technology issues are raised as part of our discussions on each sector. Particular emphasis is given to those sectors identified as priorities in our Country Assistance Plans. Our discussions on Poverty Reduction Strategies take place in a systematic way, and involve helping with formulation of strategies, implementation, monitoring and evaluation.

2. *What was the rationale behind moving the Central Research Department from the Policy Division to the Corporate Performance and Knowledge Sharing Directorate?*

- Research and knowledge are intrinsically linked. A key emphasis within the new research framework is to increase the impact of research through investing in better knowledge sharing systems. In addition, the Director-General for Knowledge Sharing and Corporate Performance has freed up additional time to give research the high-level attention that Ministers and the Management Board feel it deserves. He has had a series of meetings with Research Councils. Strong links are being retained between Policy Division and Central Research Department to ensure strong policy linkages with Policy Division Teams and regular strategic input from DFID's Heads of Professions.

3. *Can DFID provide the Committee with the job descriptions and pay scales for the new Heads of Group and Heads of Profession positions and those for the previous Chief Adviser positions?*

- These are provided at Annex 1 below.
- The new arrangements that came into effect on 17 May 2004 sought to rationalise senior management arrangements. The split in responsibilities between Chief Advisers, the Director and her Deputies, with the former group advising on policy content in their areas of expertise and the latter group overseeing delivery, had lacked clarity. The five Policy Group heads have now replaced the posts of Deputy Directors and Chief Advisers. The posts of Chief Economist and Chief Statistician have been retained consistent with our membership of the Government Economic Service and the Government Statistical Service. Given the enhanced role of Heads of Professions (HoPs) for both professional development and intellectual leadership, these posts have been re-graded at the Senior Civil Servant (SCS) level\*.
- \*Prior to 17 May, some HoPs graded at A1 were in receipt of a temporary promotion (TP) allowance to SCS pending the outcome of the Chief Advisers review, which would determine the appropriate grade for the post of HoP. With effect from 17 May all HoPs currently in the substantive grade of A1 are in receipt of a TP allowance to SCS pending successfully passing an SCS Board.
- A new policy advisory committee will be established to help guide our policy work and provide a stronger challenge function. The committee will be in place by the summer. Terms of reference for this group are provided at Annex B of this submission.

4. *How does DFID decide what advice should be provided in-house and what should be sought externally? At what levels are such decisions taken? To what extent is cost a factor in such decisions?*

- Decisions on the provision of advice to DFID depend on the context in which the advice is needed. For example technical issues that need a high level technical decision, for example in health, will be taken by DFID's relevant Head of Profession. If the issue were a key policy issue, it would be given to the relevant Policy Division team, or if no team exists, a new Policy team may be established to take the agenda forward. If the issue is to provide more detailed support, an external technical specialist may be contracted. The relevant DFID adviser, either in country offices or in HQ locations would usually be the person to take this decision. He or she would refer to the Head of Profession, where necessary, to identify the appropriate external agency or institution to approach. Value for money is always assessed when making decisions about providing resources for use in any DFID activity.

5. *By what processes, both formal and informal, does DFID identify sources of, and obtain, external scientific and technical advice? Have there been any areas of science or technology where DFID has found it difficult to access expertise?*

- This should be seen as linked to the response at question four above. In most cases advice on scientific or technical issues that is of a longer-term nature will be sought through open competition as part of a project or programme tender. This may also be in the case of identifying a research consortium or resource centre that can provide more responsive support to DFID. In some cases, where the work is of a short term and specific nature and falls below the threshold value for open competition under EU employment legislation, we may contract a specialist direct. DFID's advisers will also have external contacts through membership of professional associations and communities of practice, and will use these as appropriate. There have not been areas where DFID has found it difficult to source expertise.

6. *In oral evidence Mr Lowcock stated "we have a network of country offices which include typically in them someone with an engineering background, someone with a medical background, someone with a natural sciences background" [Q297]. Does DFID have quotas for these categories of scientifically or technically qualified staff in the country offices? Does DFID keep records of the number of staff with qualifications in the natural and physical (as opposed to social) sciences? If so, please provide the Committee with this information.*

- DFID advisory posts located in country are established to support the priorities identified in the Country Assistant Plan. They will therefore be context specific. DFID Malawi, a number of whose staff the Committee met, is typical of the skills mix in our overseas offices. There is no quota system in operation. Whilst DFID does not currently keep central records of the qualifications of its staff, we are working towards a system that will capture these from next year.

7. *What formal mechanisms are in place to enable DFID staff, especially in the Policy Division and country offices, to assimilate the results of relevant research sponsored by others (including Government departments, Research Councils, academic groups and Industry, both UK-based and overseas)?*

- The new HoPs are responsible for ensuring that relevant knowledge is managed and that DFID staff have access to it through dissemination channels such as training and retreats.
- In addition, each professional group has specific competency criteria, which require its advisers to maintain an agreed standard of knowledge, including both practical and academic knowledge, of developments in their field. DFID as a whole places high emphasis on knowledge sharing and there is a specific core staff competency of Managing Knowledge and Information required of DFID staff. This sets criteria for excellence for different grades of staff in these areas, and requires all staff to be assessed against them as part of their annual performance assessment.

8. *In oral evidence Mr Lowcock made the point that DFID, through the central research strategy, was "trying to contribute to the global pool of knowledge" [Q370]. What criteria does DFID use to evaluate the extent to which the results of the research that it sponsors are being taken up by the wider community?*

- DFID assesses the impact or potential impact of its research on poverty reduction through formal external evaluation. The criteria will vary with the type of research that has been commissioned. For example, in the forthcoming evaluation of the *renewable natural resources* research programmes, a key objective specified in the terms of reference is to identify components of the programmes which have made, or have strong potential to make, an impact on poverty. All renewable natural resources research programmes are required to annually assess research uptake by assessing how far the project has got on the following A–H scale:
  - A. Formal/informal agreement with target institution(s).
  - B. Generation of relevant research results.
  - C. Development of appropriate research-based products through adaptation/packaging.

- D. Promotion of products into target institutions.
- E. Adoption of products by target institutions.
- F. Application and replication of results in target institution programmes.
- G. Promotion of technology or behavioural change among end-users by target institutions.
- H. Adoption of technology by end users and generation of economic benefits ie developmental impact.

In the case of *social sciences*, we may specifically require the evaluation to look at the plausibility of project workshops generating wider impact (assessment of the nature of participants—did it include policy makers, etc), or assess the quality of the publications and journals in which the research is published.

- In addition, DFID has increased its investment in the communication of research, establishing a Communications Team within its Central Research Department that funds communication activities including ID21 and various internet, radio, TV and print services. This investment is specifically aimed at increasing access to the global knowledge pool by the end users of research. DFID has also established an Information and Communication for Development (ICD) Policy Team in its Information Division that analyses best practice in communication and invests in increasing the capacity of developing countries to utilise communication technology and information content. The team also works with the international development community to advocate for a more coherent and poverty-focused approach in this area. The new DFID Research Strategy prioritises communication and dissemination and recognises that investment in this area is crucial to increase the impact of research. We are currently developing a research portal that will adopt international data-sharing standards and enable DFID-funded research to be widely accessible as part of the global knowledge pool. We will also put major effort into monitoring the impact of this approach, in a joined-up way with other development partners.

9. *On what evidence was the decision to increase the DFID contribution to the CGIAR from £10 million to £20 million per annum based? How did DFID assess whether this was the optimal way of spending the money—whose views did DFID seek in order to reach this decision?*

- Increased support for the CGIAR recognises the vital role that agricultural productivity plays in combating poverty. The CGIAR is a unique world-wide collaboration of over 60 industrialised and developing countries, foundations, international and regional organisations overseeing the work of 15 international agricultural research centres mostly based in developing countries. It brings a focused research effort to bear on the principal global constraints to increased agricultural productivity. The UK Government is an active member, numbers of UK nationals contribute in differing capacities to the CGIAR's governance and UK research institutes collaborate extensively with the CGIAR's international centres. Additional support for the CGIAR recognises that it has increased its focus on poverty and that UK action might encourage other members of the international community to follow suit. The Statement from the June 2004 G8 Summit included a pledge to increase funding to the CG System.

10. *Will the Funders' Forum include representatives from NGOs, industry and developing countries? If not, how does DFID propose to incorporate their views into its discussions?*

- We are still consulting on the format and membership of the UK funders' forum, in order to draw on the experience of the ones established so far. Our concern is that it is a useful forum for action. We expect that it will include representatives of civil society and private sector. DFID's research planning process will consult widely with developing country partners, and these views will be fed into the funders' forum by DFID.

**Annex 1**

## CHIEF ADVISER—TERMS OF REFERENCE

### SUMMARY

The main responsibilities of this post are to provide vision and intellectual leadership. The post holder will also be responsible for developing and maintaining the skills base and quality of development work within DFID. The postholder will be a member of DFID's Senior Civil Service (SCS) and will work with other members of DFID's senior management to create an environment and incentives for DFID to produce innovative work of the highest quality, reflecting its core values and enhancing its reputation for professional excellence.

## BACKGROUND

All Chief Advisers help develop policies and strategies that contribute to achieving the Millennium Development Goals, and poverty elimination. They help DFID to identify and track its Public Service Agreement and Service Delivery Agreement targets. They help to build long term partnerships between DFID and other development institutions (in the UK and worldwide), governments, academia, think tanks and Whitehall, improving the coherence of the international system and its responsiveness to country led developmental processes.

Chief Advisers also help to improve the internal coherence of DFID's own work. They communicate new knowledge and thinking to Ministers and top management, and spread information to International, Regional and Policy Divisions, partly through the advisory networks that Chief Advisers maintain and are broadly responsible for. Chief Advisers are also expected to contribute broadly to corporate priorities and agendas as members of DFID's senior management team.

## DUTIES

### 1. *Advising Ministers and Senior Managers*

(i) Being responsive, on the basis of direct requests for specialist advice, comments and inputs on problems and policies.

(ii) Being proactive, on the basis of forward looking analysis of trends, issues, options and constraints that could or should shape DFID's future strategy, analysed and interpreted from a social development perspective.

### 2. *Influencing issues outside DFID*

(i) In relevant international fora as well as in networks of bilateral and multilateral organisations, civil society, and private sector partners, and, where requested by the relevant country office, in dialogue with developing country governments and civil society.

(ii) In Whitehall, strengthening DFID's involvement across HMG and harmonising government policy through improved partnerships and communication in both directions; this will include bringing relevant international experience to policy and practice.

### 3. *Promoting flows of knowledge*

(i) Into and out of DFID, by following and promoting research, by exchanging knowledge and experience through academic and practitioner networks, by organising and attending conferences, and through the internet, publications, and media events.

(ii) Within DFID, by (a) making information and field experience available to ministers and DFID staff, through written materials, websites and resource centres, and through encouraging its absorption and use in courses, seminars and discussion groups open to all; (b) encouraging members of the professional group to share experiences, concepts and methods among themselves as a "learning community" with a view to continual improvement of their capabilities.

### 4. *Raising the quality of work*

Chief Advisers champion evidence based policymaking and interdisciplinary work, and provide guidance, information and comments on relevant DFID activities within and outside Policy Division, either personally or indirectly.

### 5. *Leading throughout DFID*

The postholder will provide leadership for Advisers in DFID through very high professional credibility, by demonstrating creative responses to complex problems, by providing them with technical and moral support and professional development opportunities, and by sustaining challenging and fulfilling jobs. In line with "Investors in People" standards, Chief Advisers help to identify DFID's corporate professional needs, and to fill gaps in skills by arranging training courses, inward and outward secondments, cross visits and seminars. The postholder will specify core technical competences for the group and participate in recruitment, promotion, performance evaluation and postings processes.

## COMPETENCES

1. Giving Purpose and Direction
2. Making a personal impact
3. Thinking strategically
4. Getting the best from people



5. Focusing on Delivery
6. Learning and Improving

#### JOB DESCRIPTION—HEAD OF PROFESSION

The primary task of a Head of Profession is to lead the group of professional advisers in DFID and support the Policy Group Head. In addition the Head of Profession will: represent the Policy Group Head in areas where s/he has particular specialist knowledge and expertise; perform a deputising role for the Policy Group Head across the full range of the latter's areas of activity; and ensure coherence across policy agendas spanning the Division.

THE KEY TASKS OF THE HEAD OF PROFESSION ARE:

##### A. *Leading the Professional Group (50%)*

This will include:

- Overseeing and setting standards: defining the core professional knowledge areas and competencies; updating the competency framework in line with business need; defining requirements for membership of the group (policy of recruitment; right of return and re-entry; and level transfers into the group).
- Planning ahead: taking a strategic overview of how the group should develop (in terms of professional core knowledge and competences) to meet future business needs and establishing systems to ensure this
- Supporting HR management processes: including recruitment, postings, promotions, secondments, junior professionals, professional fast streamers.
- Building knowledge and capacity in the group: including maintaining institutional memory, identifying knowledge and competence gaps, developing knowledge and training strategy, managing knowledge and assuring the group's access to it through training retreats etc.
- Maintaining strong professional networks and facilitating access to technical expertise.
- Providing support to the group: career development and mentoring for advisers and countersignature of A1 advisory reports in PD.
- Working with other Heads of Profession in a collaborative manner to develop strategies and learn lessons across the advisory groups.

##### B. *Supporting the Policy Group Head (50%)*

This will include:

- Promoting flows of knowledge, by helping the PGH identify new trends and topics in his/her area of expertise, anticipating knowledge gaps, and advising on those areas of knowledge where DFID's investment should be significantly increased or reduced. This will be achieved by following and promoting relevant research (working with the Head of Central Research Department), exchanging knowledge and experience through academic and practitioner networks, organising conferences for the group and contributing to the development and use of Resource Centres/ Enabling Agreements and other forms of contracting specialist expertise.
- Supporting the Policy Group Head in his/her challenge function, by contributing to think pieces on recent development in development knowledge and practice in the relevant area.
- Providing technical advice and specific inputs to the Policy Group Head and to Policy Division Teams.
- Influencing outside DFID. The Head of Profession will deputise for the Policy Group Head as a spokesperson and representative of DFID in Whitehall, in international fora and in networks of bilateral and multilateral agencies, civil society, and in dialogue with developing-country governments.
- Deputising for and representing the Policy Group Head. The Head of Profession will deputise for the Policy Group Head in respect of all his/her functions in the case of his/her absence overseas or on leave. The Head of Profession will represent the Policy Group Head, carrying out his/her functions where the Head of Profession has particular specialist knowledge and expertise.

#### COMPETENCIES

Giving purpose and direction  
 Making a personal impact  
 Thinking strategically  
 Getting the best from people  
 Learning and improving  
 Focusing on delivery

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**JOB DESCRIPTION—POLICY GROUP HEAD**

1. Reporting to the Director of Policy Division, the Policy Group Head forms part of the senior management team of Policy Division (PD), helping the Director manage the entire Division. Each Policy Group Head has responsibility for up to two professional groups led by a Head of Profession and a number of policy teams.

**COMPETENCES**

2. The jobholder should have a strong record of performance across the six standard SCS competences and applicants will be asked to provide evidence on each. The ability to motivate and manage multiple, multidisciplinary teams working on a diverse range of policy issues and with rapidly changing agendas is a particular challenge of this post, as is the ability to develop strong relations with key stakeholders elsewhere in DFID, Whitehall and other development agencies. The ability to communicate effectively with a wide range of staff of many different grades, and to work co-operatively as part of a team of SCS staff (including other Policy Group Heads and Heads of Profession) is also essential. Strong candidates for the post will combine these skills with the ability to develop and maintain a sound policy and strategic oversight of all the policy teams in their Policy Group and excellent judgement of how to engage and inform ministers and top management effectively. Ideally, candidates will also demonstrate intellectual leadership in the area covered by their Group.

**DUTIES**

3. The Policy Group Head will work jointly with the Director to ensure production and implementation of an annual Director's Delivery Plan in accordance with the agreed role and purpose of Policy Division and in support of wider DFID objectives. The post holder will:

- (i) Oversee the timely production, implementation and review of high quality, demand-driven, deliverables-based work plans for each team in their Group;
- (ii) Ensure that staff in their teams maintain strong and influential relations with staff and teams working on related agendas across the rest of DFID, relevant Whitehall departments and partners in other bilateral and multilateral development agencies and civil society organisations;
- (iii) Contribute personally to the maintenance and development of positive relations between Policy Division and Private Office, other DFID Divisions and key external stakeholders;
- (iv) Providing an intellectual lead—ensure for the policy areas under their charge the provision of high quality policy advice to DFID Ministers and Top Management, the maintenance of a strong core policy capacity, and the high quality delivery of agreed policy products to Policy Division clients;
- (v) Maintain and develop sound staff management practices consistent with the Investors in People standard and with DFID best practice, including in relation to diversity issues; and promote team-working that maximises personal effectiveness and job satisfaction among staff;
- (vi) Working with others in the PD Senior Management Team, help ensure that the structure of Policy Division and the capabilities of its staff are aligned as effectively as possible to the role, purpose and priorities of the Division;
- (vii) Working with others in the PD Senior Management Team, help make resource allocation (financial and human) decisions to best ensure effective implementation of the Director's Delivery Plan;
- (viii) Working with the Heads of Profession in his/her Group, ensure that the advisory groups are well managed and helped to develop professionally.

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**TABLE OF ROLES/PAY BANDS FOR FORMER DFID CHIEF ADVISERS AND CURRENT HEADS OF PROFESSION/HEADS OF GROUP**


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**Up to April 2004**

<b>Chief Advisers</b>		<b>Heads of Profession</b>	
<i>Role</i>	<i>Pay Band</i>	<i>Role</i>	<i>Pay Band</i>
Chief Economist	2		
Chief Sustainable Development Adviser	2	Infrastructure and Urban Development	1
		Rural Livelihoods	1
		Environment	1
Chief Human Development Adviser	2	Deputy/Health	A1
		Education	A1
Chief Governance Adviser	2	Deputy/ Governance	A1

<b>Up to April 2004</b>			
<b>Chief Advisers</b>		<b>Heads of Profession</b>	
<i>Role</i>	<i>Pay Band</i>	<i>Role</i>	<i>Pay Band</i>
Chief Social Development Adviser	1		
Chief Enterprise Development Adviser	1		
Chief Statistician	1		
<b>From 17 May 2004</b>			
<b>Heads of Group</b>		<b>Heads of Profession</b>	
<i>Role</i>	<i>Pay Band</i>	<i>Role</i>	<i>Pay Band</i>
Human Development	1	Education	1
Governance and Social Development	1	Governance	1
		Social Development	1
Head of Growth and Investment and Chief Economist	2	Enterprise Development and DH Growth and Investment	1
		Dep Chief Economist	1
Sustainable Development	1	Environment	2
		Infrastructure	1
		Rural Livelihoods	1
Development Effectiveness	1	Statistics/Chief Statistician	1
Communications and Central Teams	1	Health	1

## PAY BANDS

<i>Pay Band</i>	<i>Minimum £</i>	<i>Maximum £</i>
A1	44,395	59,696
1	53,451	112,248
2	73,762	155,008
3	90,867	192,424

## APPENDIX 86

**Supplementary memorandum from the Oxford Forestry Institute, Department of Plant Sciences,  
University of Oxford**

1. Do you think that DFID's contribution to CGIAR represents best value for money for the UK in terms of achieving international development outcomes? If not, why not?

While the move by DFID away from running its own projects and towards increasing funding to the CGIAR has the advantage of simplifying management (and reducing overheads). It provides a good forum for international joint problem recognition and problem solving. However, it does not represent best value in term of achieving development outcomes for the following reasons:

- Although many of the CG centres now carry out high quality development-orientated research their research costs and scientist salaries are high relative to other international and national research institutions in developing countries. In some cases the same research and associated development outcomes could be achieved as effectively for less investment. Some donors are recognising this and starting to look for alternative means of supporting development oriented research.
- The disparity in salaries can have a negative effect on capacity-building: the very brightest and best developing country scientists tend to be creamed off by the CG system.
- Many countries contribute to the CG system by making grants to specific projects, often deliberately involving their own institutions. DFID has made both specific and unspecific core grants. By increasing unspecific core grants to CG, DFID cannot always ensure that programmes match its primary goal of poverty alleviation. Nor has it been able to ensure that unspecific funds are directed to the most appropriate institutions.

An alternative approach to the delivery of top-class research, with a clearer positive impact on development outcomes, would be for DFID to fund collaborations between Northern and Southern (national) institutions. These could include an explicit commitment to capacity-building, whilst aspects of the research for which the Southern partner was not equipped could be done by the Northern partner. DFID should investigate whether this approach would represent better value for money than the current increased focus on the CGIAR.

2. *Defra's Climate Prediction Programme contract with the Met Office Hadley Centre includes a specific requirement to build capacity in developing countries to enable them to generate their own predictions of climate change over their country. Would you support such an obligation on capacity building being placed on other Government sponsored institutes?*

We feel that DFID is likely to get better value in capacity-building exercises by a flexible approach in which other bodies (such as universities and the private sector) could compete with Government-sponsored institutes for contracts concerned with capacity building. Government institute concerned primarily with British issues may not necessarily have the development orientation needed to work effectively in developing countries. By involving a range of institutions, DFID could access a much wider range of expertise and experience in tropical and development issues.

June 2004

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## APPENDIX 87

### **Supplementary memorandum from the Environment Group, Institute of Development Studies (IDS), University of Sussex**

It is instructive to recall that this is far from the first time that issues of whether and how to mobilise S&T to meet the needs of developing countries has been addressed. The first Science, Technology and Development conference of the United Nations held in Geneva in 1963 was organised specifically to address these issues. Over 40 years later, one is struck by how few are the "success stories", particularly but by no means limited to Africa, of efforts to mobilise S&T for development and poverty reduction. The main examples of economic growth and poverty reduction associated with S&T come from East Asia. An instructive point of departure for any new policy review of S&T for development would be, we suggest, to examine the history of prior efforts and to see if guidance can be found in lessons learned from both successes and failures.

Some general capacity building guidance can be found in the successful experiences of other countries in East Asia and to a lesser extent Latin America, but it is also clear that there is no single pattern or roadmap to technology acquisition, technology learning and industrialisation. The rapid, export led economic successes of Taiwan and Singapore were based on quite different approaches. The role of government intervention was vastly different between Hong Kong and Korea. For all four of these countries, however, there seem to be a number of common characteristics associated with their success which may serve as general guides to a Vietnamese S&T strategy. These characteristics include the following:

- Their industrialisation was based primarily on export led strategies.
- The key decisions related to technological learning were made by the managers of enterprises (ie not by governments or development agencies).
- It took 20 to 30 years of specific kinds of capacity building to build all the technological capabilities needed to successfully exploit the innovations derived from domestic in-house research and development. Many technical and engineering skills had to be accumulated in the process. It may be possible that this time could be shortened to 10 to 15 years.
- Governments followed a set of macro economical policies which provided stability, low interest rates, and high savings. Governments also developed an appropriate educational and technological infrastructure, including the provision for widespread literacy, but special emphasis was accorded to vocational education, development of a cadre of engineers and the training and support of applied research scientists.

It is often asserted by international development advocates that a precondition to national development for all countries is to build indigenous scientific capabilities to international standards of excellence. The problem with this claim is that, beyond a most limited extent, there is very little evidence that lends it support. Indeed, if one looks to the area of the world that experienced over the past forty years the fastest economic growth and a rate and level of poverty reduction unmatched in history, the evidence is that scientific capabilities were, at best, a minor factor. Rapid industrialisation in East Asia did not move from science to invention to production, but the other way around. It involved a process that began with imitation and proceeded to innovation. In other terms, it began with low-tech production and assembly and proceeded over several years to high-tech through a continuous process of upgrading and innovation. It was the continuous process of upgrading and innovation that allowed the successful states of East Asia to avoid the low wage trap. *There was no leapfrog* that jumped over the different components of technological capabilities, but the acquisition of the full range of technological capabilities did occur far more quickly than had been the case for countries that had industrialised earlier. There was little or no application of scientific research and little or no new technological development.

What is often referred to as the "East Asian Miracle" is best explained with reference successful investment in high levels of national literacy, the building of engineering and business capabilities and strong leadership by states through industrial strategies. These formed the foundation for technological learning,

“reverse engineering” and subsequently to upgrading and continuous innovation. It must also be emphasised, however, that a good part of the reason for earlier East Asian success had to do with international factors that created numerous and quite easy opportunities for relatively low-cost industrial production sites to integrate into the world economy. The international context today is very different, including the fact that there has been a dramatic fall in the demand for unskilled labour and raw materials per unit of industrial production.

A further and critical lesson from other countries is that “implicit” policies of S&T are at least as important as “explicit” policies. Studies in dozens of industrial countries have shown consistently that successful linkages between technological behaviour and industrial enterprises are as much determined by a country’s fiscal, trade and education policies (“implicit” S&T policies), as by the more explicit technology policies and strategies.

Capacity building for the generation. Acquisition, application and assimilation of S&T for the development of Africa, therefore, should, in our view, be defined in terms of industrial strategy. This, we acknowledge, is contentious. In recent years, there has been considerable debate as to whether there is, in fact, a role for *national* S&T or *national* industrial policies. Starting in the 1980s in industrial countries, it has been argued that *national* S&T policies and national industrial strategies have become obsolete. The argument goes this way: national industrial and national S&T policies are designed to provide advantage to a national economy by creating and facilitating a competitive edge for the goods and services produced within the borders of the nation. A globalised trading arrangement means not only that goods, business and finance move in an unrestricted manner across national borders, but that S&T also move in the very same manner. Thus, any possible benefits from national S&T policies will quickly move (“leak”) outside the individual country and such policies are, therefore, doomed to failure in a globalised world.

In its extreme form, the argument against national industrial S&T strategies goes further. It generally accepts as desirable national policies for macroeconomic stability (eg exchange rate policies, fiscal balance). Beyond such fundamentals, however, the argument against holds that, rather than facilitating a national competitive edge, national S&T policy actually prevents development from occurring. Effective S&T decisions, it is argued, can only be made at the level of the individual company or firm; approaches to S&T must be entirely flexible in order to take advantage of rapid technological change; and national (ie government) policies are necessarily rigid and run counter to the interests of development.

Again starting in the 1980s, it was widely asserted that this same argument against industrial S&T based strategies applied to developing countries. Open borders, liberalisation and privatisation were strongly recommended. Such measures as industrial strategy and S&T policies were frowned upon as counterproductive and wasteful.

But more recent developments have produced increasingly compelling arguments in support of the link between national industrial strategies and S&T policies and the development of poorer countries. First and perhaps most significantly, the strong argument of the past 15 years against national S&T policy is itself undergoing modification as a result of new evidence. For example, by 1997 the World Bank, following extensive examination, concluded that the role of national policy was critical to establishing the conditions for development that go beyond those which the market itself is likely to create. In arriving at this conclusion, the Bank essentially reversed the stand it had taken over most of the 1980s and 1990s and argued that it was imperative for poorer countries to build specific capacities (capabilities) of human capital. In this regard, the Bank observed that the experience of the East Asian tigers as well as the failures of national efforts elsewhere lent strong support to the need for appropriate instruments of modernisation, including national S&T strategy instruments.

Secondly, the investments that go with globalisation and on which it depends have proven to be targeted by firms and companies to those locations where the comparative advantage is not only one of low cost labour but more often to areas where particular technological strengths exist. For example, companies will invest in industrial design in one country, engineering development in another, production in a third, initial sales in a fourth and after sales service networks headquartered in a fourth. Long-term national policies and actions, particularly in Asia, have been shown to be critical in attracting and retaining such investments.

Thirdly and of great significance is the fact that, if the strength of globalisation is in its wealth-creating capacity, its weakness, if undirected and uncontrolled, is being shown to lie in its disregard for and damage to the environment and its exacerbation of gross inequalities both within and between nations. In Japan, such negative consequences are increasingly defined as evidence of “market failure” as they affect deleteriously such “national purposes” as social cohesion, reasonable equity and political stability.

Thus, we define capacity building in light of the above as the complex sets of policies required by an industrial strategy that are focussed on the specific capabilities required for technology generation, acquisition, application and assimilation.

There is frankly far too much in the way of very fuzzy thinking around the role of S&T in development. The “hype” that we have witnessed over the past decade about “knowledge” societies’ has served mainly to increase the muddle. It has become common place for development agencies to speak of knowledge societies and knowledge based economies. This is not surprising, as management journals are filled with concepts such as the “knowledge revolution”, “knowledge organisations”, “learning organisations”, and “information-driven change”. These are usually linked to technological change, especially in information

and communications technologies, and to the globalisation of production systems. The same concepts and linkages are now central to international development organisations and to development dialogues. To illustrate, the World Development Report of 1998, concluded that:

“... the balance between knowledge and resources has shifted so far in the direction of the former that knowledge has become perhaps the most important factor determining the standard of living... Today’s most technologically advanced economies are truly knowledge based.”

Knowledge and information have become the focus of development efforts and many PRSPs assign priority to “joining the knowledge revolution, undertake knowledge assessments, knowledge strategies”, and so on. Poor countries are counseled that failure to “join the knowledge revolution” means falling further behind in their quest for development.

The current emphasis being placed by international development organisations on access to knowledge and information can certainly have positive results. There is also, however, need for some caution. Development thinking has long been known for its faddishness, for coming up with the answer to development needs, and for abandoning that answer and moving to the next new answer when it becomes fashionable. There are real dangers in presenting knowledge and information as commodities that can simply be transferred from rich to poor countries in attempts to “solve” poverty.

In the same way as development thinking on technology transfer in the 1960s and 1970s focused on machinery and the logistics of getting hardware from rich to poor countries, a lot of today’s development dialogue on knowledge and development is dominated by assumptions that the main task is to transfer information technologies and knowledge from one place to another. Such thinking is not only misleading, it is dangerous. Martin Bell makes this point forcefully:

“The main thing to recognise is that *getting access to technology is less than half the problem*. What happens after that will usually be much more important. Indeed, the vigorous dynamic assimilation of what was previously imported may become an increasingly necessary basis for getting access to ‘vintages’ of imported technology. And, . . . closer to the international technological frontier . . . access to the foreign technology may depend as much on being able to exchange technology as being able to pay for it. *What you get depends on what you’ve got.*”<sup>130</sup>

The point is that it is learning and organising for learning that matter in acquiring technology. The same applies to knowledge. Developing countries do need to gain access to the modern technologies of information and also to global information, but the easier part of any link between knowledge and development. Moreover, it is not access to the technologies or to information itself that makes the difference in terms of development. What does make the difference is the capacity for and the process of absorption and ongoing learning. The research on technology transfer and the processes through which new knowledge is incorporated demonstrate that the central requirements for success are organisational and cultural change. Learning to learn and creating organisational structures that facilitate learning are the critical components for the transfer of technology and knowledge.<sup>131</sup>

Knowledge is undeniably becoming one of the essential ingredients of both wealth creation and improvements in the quality of life in the majority of countries of the world. For poor countries to take full advantage of this will require a strategy that goes far beyond obtaining new hardware and gaining access to information systems. It will require enhanced capabilities to perform five tasks with regard to knowledge. These are the ability to create knowledge; acquire knowledge; assimilate knowledge; use knowledge; and to diffuse knowledge.

And these requirements pose particular challenges. First, the “culture” of knowledge management in most poor countries is usually grounded in an antiquated model that is in need of major transformation. This is the linear model that functions on the basis that knowledge is created in one set of institutions (eg universities and research institutes) and then used by others in a different set of institutions (eg firms or public services). The underlying idea is that knowledge is generated in one area by researchers and knowledge producers and then used in another area by policy makers. Secondly, effective knowledge management is not only a question of bringing about better connections between existing institutions (eg between knowledge producers and knowledge users), it is also a matter of the suitability of existing institutions. The formal institutional structures of knowledge management in most poor countries are generally governmental and bureaucratic (in many countries, they simply do not exist), whereas knowledge based economies are based on institutions that process knowledge in “real time” and whose decision makers are capable of agile policy responses to new knowledge and changing circumstances.

Increasingly, since the 1970s, industrial countries have been abandoning the linear model of knowledge. In fact, the relationship between the production of new knowledge and its application has experienced in the past two decades its most profound transformation since the 18th Century. The viewpoint of international firms is that they need *immediate* access to research and knowledge that will allow them not only to deliver low-priced goods and services of greater quality and diversity, but also to retain and expand

<sup>130</sup> Bell, Martin, 1997, Technology transfer to transition countries: are there lessons from the experience of the post-war industrialising countries? In *The Technology of Transition, Science and Technology Policies for Transition Countries*, D Dyker, ed, Central European University Press, Budapest.

<sup>131</sup> See Bessant, John and R French, 1999, Using learning networks to help improve manufacturing competitiveness, *Technovation*, Vol 19.

their “market share”. This, they have concluded cannot be achieved without *integrating research, industrial design and production and ensuring continuous innovation and improvements*. Throughout the world, firms have abolished their departments of research, applied research, engineering and strategic planning and have integrated their functions fully into their production departments.

This same trend is now occurring in public institutions. Decision-makers in governments in much of the world, including China, are, in effect, abandoning the linear model. In many countries, this is being driven by purely financial considerations. It is also, however, motivated by the same considerations reached by the industrial sector (ie that much of research should be “demand-driven”; that major benefits result from a tighter integration of the functions of research, design and production, that that continuous innovation is essential). For example, universities (including universities in China) are being required to compete for and raise by themselves the funds required for research.

#### THE DRIVERS OF THE CHANGE

The basic nature of the relationship between knowledge producers and knowledge users has been undergoing a fundamental change. The metaphor of a “tidal wave” has been used to characterise the enormous amount knowledge being put before managers, government officers, executives, and policy-makers everywhere.<sup>132</sup> Although surprise is expressed at this situation, it is not one that came about suddenly. Rather, it evolved steadily over the last 80 years, but its size and momentum have grown exponentially over the past few years. Some of the main features of the new “knowledge societies” as they relate to decision making and decision makers are the following.

- *The speed at which knowledge is being created is unprecedented.* A universal complaint of policy-makers today is that they are faced with information overload. Knowledge has been growing at an astonishing pace. The explosive growth in knowledge has been described by David Linowes in the following terms:

“It took from the time of Christ to the mid-eighteenth century for knowledge to double. It doubled again 150 years later, and then again in only 50 years. Today it doubles every four or five years. More new information has been produced in the last 30 years than in the previous 5,000.”<sup>133</sup>

This is not surprising. Scientific advances and technological innovations are at the root to the complex transformations that have taken place during the last half-century. Increasingly, the products of research in the forms of science and technology have become deeply enmeshed in all aspects of human activity. This helps to explain why there is so much “hype” today about “knowledge societies” as the key to future success. Most observers agree that this has profound implications not only for development prospects, but for the organisation of human activities and for all aspects of social policy.<sup>134</sup>

- *Networks have become the organisational basis for policy-making.* By their very nature, knowledge based systems require the integration of inputs and actors into the process of decision-making. The commercial linkages between transnational corporations now covers manufacturing, finance, trade, and services. Strategic alliances between corporations in pre-competitive research and development, coupled with fierce competition in final-product markets, demand new corporate and national strategies. A significant shift is taking place in the organisation of productive and serviced activities in the globalised segments of the world economy. The economic unit is no longer the enterprise, either local, international, or transnational, but a specific network created for a particular purpose at a particular time, which operates in larger part independently of the various enterprises that established it. As Castells points out:

“. . . organisational arrangements . . . are all based on networks. *Networks are the fundamental stuff of which new organisations are and will be made.*”<sup>135</sup>

- *Policymaking has become more complex and difficult.* This is especially true in the public domain where an increasing number of issues interact with each other, more actors are involved, time has accelerated and second order effects have become more important. There is a need to take into consideration not only domestic issues, but an important range of external factors. This is the case not only for economic and business decisions but also for social decisions. According to some observers,<sup>136</sup> strictly domestic policies hardly exist any more. The policy maker, therefore, has been internationalised and must articulate a range of external and internal factors and does not have the luxury of focusing only on domestic constituencies.

<sup>132</sup> See Sagasti, Francisco, 1999, *Development Cooperation in a Fractured Global Order*, IDRC Books, Ottawa.

<sup>133</sup> Cited in Sagasti, Francisco, *op cit*.

<sup>134</sup> See, for example, Drucker, Peter, 1968, *The Age of Discontinuity*, Harper and Row, New York, NY.

<sup>135</sup> Castells, Manuel, 1996, *The Rise of the Network Society*, Blackwell Publishing Inc., Cambridge MA, USA.

<sup>136</sup> See, for example, Deacon, Bob, 1998, *The Prospects for Global Social Policy*, in *Aspects of Global Social Policy Analysis*, B Deacon, M Koivusalo, and P Stubbs, eds, Stakes: Helsinki.

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- *The process of policy implementation has also become more complex.* Policy instruments (which include legal devices, organisational structures and operational mechanisms) must contend with multiple perspectives and a growing variety of interest groups (many of which focus only on a single issue). This requires that many more issues be taken into consideration in the implementation of policies.

This brief assessment indicates that integration into the global market is accompanied by industrial, financial and policy processes that become more knowledge and information intensive and more dependent on information technologies. Approaches that focus on the provision of bits of knowledge and information (ie filling important gaps) may be helpful but they are unlikely to promote widespread development. Much broader approaches are needed that aim at the underlying requirements for institutional and cultural changes and the development of the human capabilities needed for effective creation, acquisition, assimilation, use and diffusion of knowledge.

In brief, what this requires is a systemic approach that aims to see how the pieces of a very complex puzzle inter-relate and add up to the larger picture. This does not mean that everything must be done at once. Some actions and reforms must be initiated before others if systemic change is to be functional. For example, if major industrial restructuring is likely to produce widespread unemployment and human suffering, adequate social safety arrangements should be in place before the restructuring. Some key elements for such a systemic approach would be the following:

#### AN EFFECTIVE ECONOMIC AND INCENTIVE REGIME

High priority needs to be accorded to the economic and incentive regime. This is imperative to establish the base of dynamic and competitive firms that need the knowledge outputs of science and technology in order to compete internationally and to grow. Without a critical mass of such firms, the “demand-pull” that is the foundation for all effective national knowledge system is unlikely to emerge. In this regard, the private sector is vital and needs strong encouragement from the state.

An effective economic and incentive regime is also imperative to attract and retain direct foreign investment (FDI) and the experience of other countries is that FDI has contributed disproportionate to technological advance. With the exception of Singapore, FDI represented a relatively modest proportion of investment in the tigers, but its technological effects were exceedingly large. FDI was the most important factor in opening up export markets to the tiger economies. Research also shows that the TNCs frequently acted as demonstrators and role models for local companies. Some foreign operations were responsible for extensive training of engineers and managers, and for transferring skills and know-how. There is also evidence that local engineers trained by FDI investors left the parent firm to set up their own companies (often to supply the subsidiary with components or some kind of technical services, thereby creating important backward linkages).

#### INFORMATION AND COMMUNICATION TECHNOLOGIES

There is sufficient evidence that ISTs comprise a “transformative technology” which is affecting the structure and functioning of both economic and social systems and which compares with earlier transformative technologies such as electricity, the automobile and the telephone. Some claims may be exaggerated, but there is little doubt that ICT is improving the speed and efficiency of markets, reducing transactions costs, and making possible a range of products and services that were inconceivable only a few years ago. Comparative advantage in international markets will require increasingly a solid foundation in this new technology. Knowledge for development will also require the existence of an efficient internet infrastructure. There is already growing evidence throughout the world that ICTs are creating a “digital divide” between the richest and the poorest. This indicates a critical role for government through proactive policies to provide widespread access to ICT, including its disadvantaged and vulnerable groups.

In general, however, this does not mean regulation by government, but rather timely actions aimed at facilitating low cost (ie affordable) access and supporting social applications. The reality of this sector is that it involves a market that moves much faster than any regulator can anticipate. It follows, therefore, that:

- Where regulatory controls exist, they should be removed as quickly as possible.
- Highest priority should be given to national public and private investments that expand access to the Internet, including improvement and expansion of the telecommunications and mobile telephone networks.
- Lower to internationally comparative levels the costs of accessing and using the internet.

Because the older public policy mechanisms of control and regulation cannot be expected to work, the role required of government is complex and delicate.



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## FACILITATING SAVINGS FROM AGRICULTURE AND THE GROWTH OF RURAL INDUSTRY

At present, over 75% Sub-Saharan Africans and most of Africa's poor reside in rural areas. Food production accounts for over 50% of the total rural economic output. A key question becomes, what can S&T contribute to increasing the rural agricultural productive base and to the reduction of poverty?

The competitive advantage of most African countries in international trade in agricultural products is being defined increasingly by the technological competitiveness of the leading biotechnology firms in industrial countries. For much of the developing world, agricultural competitive advantage and export potentials are being strongly determined by biotechnological advances in China, India and Brazil. China has confirmed its intention to apply the new knowledge potentials of biotechnology to the fullest in its national agricultural development.

There is another knowledge factor worth mentioning in thinking about biotechnology and African agricultural production, rural development and poverty reduction. It is that, the history of many Southeast Asian countries shows that agriculture, especially highly advanced science-based agriculture, served as the early engine of domestic savings and set in place the investments required for rapid and sustained economic growth.

The lead-time required for the acquisition of the full range of capabilities required for industrial value-added international competition is considerable, as the East Asian experience has shown. It would seem probable, therefore, that the overall economy of Sub-Saharan Africa over the next decade or so will continue to be heavily based in rural agriculture and that this will account for at least 40% of GDP and will occupy at least 65% of the workforce. Over the next decade, therefore, if growth in farm incomes is to come about, it will come through diversification towards higher value crops, livestock, seafood and aquaculture production. The combination of high overall economic growth and an accelerating pace of urbanisation will shift domestic demand away from staple foods toward livestock products, cooking oil, fruits and nuts, vegetables, and processed foods that require less preparation time. A much greater application of new knowledge, including biotechnology, will be imperative to this process. The contribution of such higher value diversification to the required increase in national domestic could be considerable.

## DEVELOPING HUMAN RESOURCES

The effectiveness of all aspects of a knowledge strategy depends ultimately on the knowledge and skills of people. Although opinions differ strongly on the contribution of different factors to the dramatic successes of the Asian tigers, there is universal agreement that this depended on prior investment in an educated human resource base. As East Asian states transformed from agricultural to industrial societies, it became apparent that this depended on a well-educated work force to meet the demands of complex industrial and manufacturing economies. Beginning 40 or even 50 years ago, the governments of those states instituted universal, compulsory education of high quality for all citizens and discontinued the tradition of elite education, at least through the junior high school years. The emphasis was twofold: achieving a well-educated population through primary and secondary education and meeting the more specific skills and capabilities called for by industry through demand-led academic and vocational programmes. Because there were limitations to the public funds that could be made available, post-secondary education was strongly focussed on technical skills.

This formula is neither exotic nor surprising. Over the past quarter century, it has clearly been at the root of the successful transformation of several East Asian states through export-led industrial and manufacturing. The formula, however, is inclined far more to an emphasis on rote learning than to creative problem solving. It leads far more to success through "imitative opportunities" and to the application of existing technologies than to inventiveness, innovation and experimentation. A world-wide comparison of figures on patents lends strong support to this argument. Over the past 20 years, remarkably few patents have been recorded in the Asian tigers.

Some East Asian governments (especially Japan) have recently expressed concern over this—over what they see as a rapidly changing relationship between human resources and economic comparative advantage. The centrality of knowledge to the production of goods and services in a global economy, the speed and scope of technological advance and the extent of uncertainty and change have combined to place the highest premium on capabilities that stress problem solving. Both Malaysia and Singapore have announced plans to modify school curricula in order to expose young people to diverse ideas and to learning based more on problem solving.

School curriculum matters and is all too often neglected. Here again, there may be a lesson from East Asia. Singapore, Korea and Taiwan placed early curriculum emphasis on special demand-led technical training programmes. The most immediate need is to address major gaps in technological capabilities (ie the range of skills needed for technology management—this was specifically the case for Singapore and Taiwan in the 1960s and 1970s where curriculum reforms and tailored programmes aimed at the technology management skills required by SMEs.

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#### A STRATEGIC APPROACH TO SCIENCE AND SCIENTIFIC RESEARCH

Scientists and scientific researchers (and developing country scientists who received advanced training in Western Universities) do not welcome the statement that basic science and scientific research had very little to do with the export led industrialisation successes of the Asian tigers, but the statement is true. This contrasts sharply with the experience of South America during the 1960s and 70s when import substitution approaches to industrialisation depended on relatively strong local capabilities in science and in technology research. In recent years that base has been eroded as its usefulness to Latin American industry has declined. Now it is primarily in a few high technology and advanced scientific areas that there are industrial benefits from the scientific base.

If a national scientific base had little relevance to the successes of the Asian tigers and if the utility of such a base to Latin American industry has been overtaken by global economic integration, what is the place of this in a Vietnamese strategy for S&T? This question is being asked today in many countries, both advanced and developing and it is proving difficult to answer. Part of the reason lies in a long history where scientific and technological knowledge was viewed as a linear process. Support to basic scientific research was predicated on the view that it would contribute knowledge which would subsequently be developed through applied research into technologies which would then, in turn, be developed for productive purposes. Institutions were specialised and segmented in order that they could focus separately on each part of this linear chain of activities.

Basic science and scientific research may of course merit support on the basis of their intrinsic merits. An increasing trend throughout the world, however, is to treat science and technology not as linear but as parts of a complex process whereby new knowledge is generated at all stages in the chain of events. Governments everywhere are seeking to replace the previous model of linearity and segmentation with the means to integrate science, technology and innovation into continuous, multi-directional processes. The conduct of publicly funded science and scientific research is increasingly characterised by the following factors:

- The curtailment of core financial support and a requirement that research institutes obtain more of their funding from a variety of contract sources. This imposes a need for new management skills as the research institute seeks to meet the different accounting requirements of a variety of donors, sponsors, and clients.
- Greater public accountability for the funds received. This has led to the development of research output indicators and more frequent and thorough assessment and evaluation of research institutions.
- The expansion of collaborative research programs often involving researchers in university, industry and government laboratories. These collaborative programs occur both within and between countries.
- The involvement of sponsors and potential beneficiaries in the setting of research priorities.
- The setting up of new “spin-off” enterprises based on successful research outcomes. Sometimes, as in university settings, these are established by academic entrepreneurs, other times they are “privatised” research establishments, and sometimes they are spin-off enterprises as has occurred with the Academy and other research institutes in China.

The problem with applying the above factors for Africa, with the exception of RSA, is the relative absence the dynamic and competitive firms needed to provide effective demand-pull for science and technology products. This cannot be solved quickly. For most countries, nevertheless, the policy process would still benefit from clearer insistence that publicly funded research focus in areas of short-term comparative advantage in the agricultural and SME sectors (again a matter of viewing capacity building within an industrial strategy context).

#### WHAT APPROACH SHOULD BE ADOPTED IN A UNITED KINGDOM POLICY ON APPLYING S&T FOR DEVELOPMENT, ESPECIALLY FOR AFRICA?

It is important to recall that there were extensive efforts in the aid programmes of the 1960s and 1970s to build research capabilities in African countries and, more generally, to catalyse national S&T infrastructures. “Twinning” programmes between universities and research centres, scholarship schemes and extensive technical assistance were the foundations of these efforts. As a general rule, they are regarded in retrospect as having fallen far short of their objectives. By the 1980s, most had been abandoned. Yet there were some major successes. The one that is usually held up as the most successful example in Africa is the African Economic Research Consortium (AERC), an initiative launched initially by Canada’s IDRC with subsequent support from the Rockefeller Foundation. The approach taken in this effort contained a number of significant differences from the general pattern and these differences suggest a framework for UK consideration. Some of the more important ruling dimensions were:

- Acceptance that the capacity building required would need a very lengthy time frame and would not be at all conducive to standard logframe approaches. It took the better part of two decades for the initiative to gain widespread international recognition. Commitment to the initiative is continuing.

- Financing needed to be assured, predicable and adequate, both for the African institutions that participated and for their partner institutions in developed countries. Multi-year commitments to all parties proved essential to the required engagement in long-term, patient capacity creation.
- A high tolerance of error was required. Especially in its first decade, the quantity and quality of outputs was highly uneven, flexible responses and very high levels of coaching and mentoring were required.

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## APPENDIX 88

### Supplementary memorandum from the Chairs of the Independent Programme Advisory Committees of the DFID Renewable Natural Resources Research Programmes

Question 1: *Do you think that DFID's contribution to the CGIAR represents best value for money for the UK in terms of achieving international development outcomes? If not, why not?*

1. This response is submitted on behalf of the PAC Chairs of five of the Independent Advisory Committees (PACs) of DFID's Renewable Natural Resources Research (RNRRS) programmes. Several of these individuals have worked in association with CGIAR centres, and one PAC member was formerly a director-general of one of them.

2. An earlier statement from the PAC Chairs on the question of DID support for the CGIAR has been provided in their first written submission to the STC on 14 November 2003 (see paragraph 17, and Recommendation 2 of that submission).

3. The term "best value for money" is somewhat inappropriate in the present context. The funding of multilateral and bilateral research is not an "either/or" issue. The CGIAR system is a very important contributor to international development and is highly complementary to other programmes, including those of DFID, such as the RNRRS and other bilateral initiatives. While the CG centres have particular strengths in various parts of the research-development-application continuum, summarised below in paragraph 4, they are increasingly dependent upon, and actively seek, partnerships for most of their activities. In recent years, the number of internationally recruited scientists in most CG centres has fallen to a level well below that of equivalently qualified scientists in major advanced research institutions (ARIs) in the developed world. Partnerships and networking by the CGIAR are increasingly supported by the international donor community, with good examples being the Challenge Programmes for Water and Food, and Unlocking Genetic Diversity, as well as the System-Wide Initiatives on Malaria and Agriculture, and Water Management.

4. As in the case of DFID's RNRRS programmes, the CG centres do not have mandated mechanisms for ensuring uptake of research outcomes, and are therefore highly dependent on the capacity of partner developing countries with or without donor support to do this. Developing country research and extension systems (NARES) are therefore essential partners for the CGIAR. However, these are often weak—especially in Sub-Saharan Africa—and heavy investment by donors is needed to address this constraint.

5. The strengths for which the CG centres have been most noted over the past three to four decades are germplasm collection, conservation and improvement, with special emphasis on the major food staples of the poor. Centres to address researchable problems of livestock, forestry and fisheries were established somewhat later, as were two institutes dealing with socio-economics and policy, and enhancing institutions, respectively. In all cases, the CG centres have international remits, which means that they can provide spillover opportunities to many countries for the outcomes of programmes that may have a more limited geographical mandate, such as those of DFID.

6. In terms of strategic research, the CG centres have increasingly relied on partnerships with ARIs mostly, but not exclusively (eg China, India, and Brazil), in developed countries for work, such as that on biotechnology for crop improvement and the management of livestock diseases. Partnerships with ARIs have also been developed for work on the more basic aspects of the interrelationships between crops, soil and water resources, as well as the management of pests and diseases, and longer terms issues of climate change. DFID's RNRRS programmes have played a significant role in forging and supporting these partnerships. Examples include the Animal Health Programme with research partnerships investigating livestock diseases in Africa, and the Crop Protection Programme for work that addresses diseases of major staple root crops—also in Africa.

7. Partnerships between the CGIAR and the private sector have been very limited, and largely confined to biotechnology for crop improvement and vaccine production for the control of livestock diseases. Research that addresses the needs of the very poor is largely concerned with the production of international public goods, and is thus generally unattractive to the private sector. This also applies to the programmes of the CGIAR's partners. There are thus very clear grounds for a long-term commitment by donors such as DFID to support research that targets those in extreme poverty.

8. The CG centres' mandates do not include agricultural or horticultural cash crops such as cotton, cocoa, fruits or vegetables, yet these are increasingly important as sources of income for the poor. Partnerships between ARIs and national programmes have been the major means of addressing needs-driven research on these commodities, and donors such as DFID through its RNRRS programmes have provided significant support. This has to be maintained for the foreseeable future.

9. It can be concluded that the CGIAR centres represent a sound investment for DFID, provided that appropriate support is also provided for the partnerships with national programmes and ARIs, on which the CG system is totally dependent. In other words a "joined-up" funding approach is required. This means that DFID must have internal capacity to effectively allocate resources between centres and programmes within the CGIAR system, on the basis of rigorous assessments of how effectively the outcomes of centre programmes meet the needs of the poor. These analyses must also take into account the contributions of the partners referred to above.

10. DFID needs to clarify whether the additional contribution of £30 million to the CGIAR over the next three years has been made on the basis of such an evaluation, or whether this will be undertaken before the funds are allocated. The latter would imply that the funds are to be provided on an unrestricted core basis, which does not accord with DFID's current policy of accountability for either multi-lateral or bilateral agricultural research programmes.

11. The issue of capacity building raised in the second additional question from the STC is also very relevant to the CGIAR. Most CG centres do have training programmes for national scientists, but donor funding earmarked for such activities is becoming increasingly limited, and centres are unwilling to assign core funds for this purpose. There is therefore a clear need for a coherent strategy on capacity building, as outlined in the response to the second supplementary question from the STC below.

*Question 2: Defra's Climate Prediction Programme contract with the Met Office Hadley Centre includes a specific requirement to build capacity in developing countries to enable them to generate their own predictions of climate change over their country. Would you support such an obligation on capacity building being placed on other government sponsored institutes?*

12. The question of capacity building was first addressed by the PAC Chairs in their written submission to the STC on 14 November 2003 (see paragraphs 29–33 and 29–44 of that submission).

13. Responses to this additional question from the STC have been provided by a number of PAC Chairs together with feedback from several RNRRS programme managers. These have addressed the broader issues of capacity building and, in one instance, the specific issue of climate change prediction. It has been assumed that "government sponsored institutes" in Question 2 also includes universities. If not, they need to be included as their responsibility for capacity building should be no different to that of government funded research institutes.

14. The latter emphasised the importance of climate change prediction and associated management options for the forestry sector, as trees are long-lived and the consequent time-lag in any management response such as a change of species in a planted forest. Developing countries need to be able to develop their own long-term strategies for the sector, and this requires appropriate training.

15. In the broader context of agriculture, forestry and fisheries, effective capacity building is essential if DFID support in agricultural science and technology is to lead to sustainable development that targets the very poor, and is not dependent on long-term donor intervention. Capacity building has to be a fully integrated part of the development process—best seen as a research-development-application continuum—or run in close association with it. The training must be needs driven and thus be based on a meaningful analysis of what these needs really are. It can be undertaken in-country with local and regional representation, or in OECD countries when this is required. Pressure for the more costly latter option often comes from developed country institutions, including some in the UK supported by the Research Councils, and this requires careful scrutiny to determine whether such training does indeed provide value for money in terms of relevance and likely impact.

16. There has been no explicit contractual requirement for programmes supported by DFID, such as the RNRRS, to undertake capacity building, and few formal mechanisms other than a number of small grant schemes are available for this. The RNRRS programmes have addressed capacity building through various avenues, but principally through partnerships relevant to local needs. These partnerships are often interdisciplinary and involve several countries, with developing and developed country partners having equal standing.

17. Capacity building in these partnerships is focussed on specific projects, and as such tends to be small-scale and discontinuous. This limited approach means that there is no training in core requirements such as research organisation and management or other broader issues needed for strengthening entire institutions. Yet, it is universally recognised that there is a compelling need for institution building on a massive scale, especially in Africa, if sustainable development in the agriculture sector is to become a reality. In this regard, it is unfortunate that the CGIAR organisation known as the International Service for National Agriculture Research (ISNAR) has, because of lack of donor support, been reduced to a single programme within

another centre. There is an ever-increasing need for the kind of work undertaken by ISNAR, which should therefore be addressed through other approaches, for example, establishing units for this purpose in individual CG centres or within regional organisations.

18. In conclusion, there is thus a clear requirement, and an excellent opportunity, for DFID to demonstrate leadership among the international donor community in developing and managing a coherent strategy for capacity building and institutional strengthening. This should be integrated or closely aligned with DFID's overall programmes of research-development-application in agriculture and associated sectors. In direct response to the STC query, there would thus be considerable merit in capacity building and institutional strengthening being included as a specific requirement of DFID contracts with providers of agricultural science and technology for development. However, proper provision has to be made for this in terms of funding.

May 2004

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## APPENDIX 89

### Supplementary memorandum from Prospect

#### INTRODUCTION

1. Prospect submitted evidence to the Science and Technology Select Committee's inquiry in November 2003. Since then, we have been monitoring the progress of the Select Committee's deliberations with interest. In addition, the International Development Select Committee has announced an inquiry into "DFID's Agricultural Policy". This supplementary submission addresses in brief agricultural matters of relevance to the International Development Committee's inquiry, and it responds to issues arising from the oral evidence presented to the Science and Technology Select Committee. These issues are of the utmost importance to our members so, whilst appreciating the time constraints on the Select Committee, we would welcome an opportunity to supplement this note with oral evidence.

#### DFID'S AGRICULTURAL POLICY

2. In December 2003, DFID released a policy paper entitled "Agriculture and poverty reduction: unlocking the potential". Prospect welcomes DFID's renewed commitment to agriculture, the extra funds announced for the Consultative Group on International Agricultural Research (CGIAR) and for the African Agricultural Technology Foundation (AATF) but regrets that there is no additional support for scientific research into agriculture that UK institutes could bid for. It also regrets that the achievements of the Renewable Natural Resources Research Strategy (RNRRS) are not emphasised and that no policy for how this strategy will be continued is proposed. Prospect is disappointed that of 11 examples of DFID support to agriculture in Africa listed (see Box 1 of the policy paper) none concern science, with all examples referring to policy, capacity building, land tenure issues, marketing, technology transfer or transport. The policy document emphasises the roles of agro-economic, infrastructure and social issues, reflecting the increasing emphasis within DFID for these subjects, although a commitment to livestock vaccines is included. Although social sciences undoubtedly have a valuable contribution to make to international development, the problems of the developing world do need the appliance of science to enhance agricultural production, achievable by the development and harnessing of improved means of crop production, crop protection and post-harvest product conservation within sustainable rural systems. The first priority is to find remedies to starvation and disease and, without doubt, the solutions lie in agriculture and medicine.

#### COMMENTS ON MATTERS ARISING FROM ORAL EVIDENCE PRESENTED TO THE SELECT COMMITTEE (TO 15 MARCH 2004)

##### *Decline of UK scientific institutions dedicated to research, technology transfer and capacity building for the benefit of developing countries*

3. In oral evidence on 15 March, it was pointed out that the future of the Oxford Forestry Institute is bleak without an immediate injection of financial support from the aid budget. Prospect is concerned to emphasise this also applies to the aid-related work of other UK-based institutes such as the Natural Resources Institute (NRI) and CABI. The urgent need for remedial financial action to prevent the collapse of NRI has not been aired sufficiently in the proceedings to date. Funding from the current DFID Renewable Natural Resources Research Strategy that supports the bulk of NRI's scientific endeavours will cease on 31 March 2005. Details of the topics to be supported by the new Research Strategy have not been announced. If the current trend for increasing support for social and economic studies at the expense of science, technology and engineering continues, there will be an inevitable—and perhaps fatal—decline in

the UK's ability to assist in the formulation of policies and practical solutions to the many agricultural, medical and environmental problems faced by the poor and impoverished across all geographical areas of the developing world.

4. Since November 2003, Prospect has learnt that all of NRI will soon be confined to two floors of one building at the Medway campus of the University of Greenwich (where in 1988 it occupied five three-storey buildings). This move will also involve the destruction of laboratories in favour of office space, thereby jeopardising the Institute's ability to recover its scientific capacity and to train scientists from developing countries in laboratory-based techniques. NRI's suite of training rooms is also under threat of conversion to an alternative use and the survival of unique libraries, archives and data-bases on developing country topics, built up at public expense during the past 100 years, is far from assured. At present, NRI still has substantial capacity for tackling pre-harvest and post-harvest agricultural, veterinary, environmental and health-related problems and for providing appropriate training, in support of DFID programmes. It can also provide DFID with scientific and technical advice. However, once such a standing capacity has been disbanded, it will be extremely difficult and expensive to re-create.

#### *Preparation of new DFID research strategy*

5. Also in March, the Select Committee Chair asked witnesses for the source and location of evidence used by DFID in preparation of their new research strategy. Prospect understands that nearly 600 ideas for new research themes were submitted to DFID. Whilst Prospect cannot provide the Committee with details of the majority of these suggestions, we can draw attention to those that were submitted by the NRI. The titles of these suggestions for using science and technology to assist DFID in making policy and reducing poverty, death and disease in developing countries include:

- Combating extreme poverty through sustainable agriculture.
- Assessing the risks, and sharing the benefits, of transgenic technologies for developing countries.
- Urban environmental management and policy.
- Improving livelihoods by reducing impacts of infectious, emerging and re-emerging diseases.
- Vulnerability and environmental degradation in the drylands.
- Impact of food aid on food security and self-sustaining development.
- Improving food and nutrition systems to contribute to eradicating poverty and hunger.
- Food chain approach to food safety.
- Management of wild natural resources—fisheries, forestry and wildlife.
- Sustainable commodity chains in a globalised world.
- Water and livelihoods.
- HIV/AIDS and rural livelihoods.
- Sustainable management of trans-boundary phenomena that threaten livelihoods.
- Integrating biodiversity, livelihoods and health through research and action.
- The role of livestock in poverty alleviation.
- Limited scientific foundation for organic and low input production systems in the developing world on which many resource-poor farmers depend.
- Furthering green revolution gains in rice-based cropping systems in Asia.
- Strengthening the institutional architecture for research and technology to enhance pro-poor impact.
- Livelihoods and access to energy through partnerships.
- Understanding and promoting pro-poor innovation capacity.
- Cassava from “cradle to grave”; a commodity-focused case study in development.

#### *Alleged “brain drain” of scientists from developing countries*

6. The problem of developing country personnel trained in western countries failing to return to their own countries of origin was raised in the evidence discussed in February, when a case was made based on a sample of six Gambian students of whom only one was intending to return to Gambia. Also, in March, the Select Committee considered the supposed “brain drain” of scientists from developing countries who are trained on programmes supported by aid funds but who then remain in developed countries to pursue their careers without contributing to the scientific capacity of their own countries. In January, the flow of health professionals from developing to developed countries was discussed. Prospect cannot comment authoritatively on the position of health workers, but it is our belief that, with regard to applied scientists, the alleged “brain drain” has been over-emphasised. The majority of scientists trained in the UK in applied

techniques relevant to the solution of developing country problems return to their own countries and continue to work in scientific capacities and in the formulation of policies there. Our earlier submission provides evidence to substantiate this view: see in particular paragraph 21 and annex 3.

#### *Use of earth-observation satellites*

7. Prospect endorses Professor John Lawton's remarks about the potential use of earth-observation satellites for monitoring developing countries remotely. We also note that DFID has supported—and is supporting—research on the use of satellite imagery for, amongst other topics, monitoring fires and for assessing rainfall for forecasting outbreaks of migrant pests such as locusts, armyworm moths and red-billed quelea birds.

#### *The Darwin Initiative and UK Research Council grants*

8. The Select Committee have enquired whether the Darwin Initiative could be used as a model for other aid programmes. The Darwin Initiative was the brain-child of the late Dr Ian Haines, formerly of NRI, who worked tirelessly when at DFID for improved natural resource management in developing countries. Originally announced at the Rio Earth Summit in 1992, management of the programme is currently undertaken by DEFRA. Prospect endorses Professor Lawton's remarks about the Darwin Initiative's contribution to assisting developing countries meet their obligations under the Convention on Biological Diversity but supports Dr Poulter's comments about the low level of its grants (as far as institutes needing to recover full economic costs are concerned) and that it is largely supply-driven not demand-led. All Darwin projects must have a principal investigator who is UK-based and through whom the funds are channelled. Thus proposals are made by UK researchers, albeit in close collaboration with government departments, scientists and NGOs in developing countries. Although DFID does pay fully overheaded costs for UK-based research sponsored under its Renewable Natural Resources Research programmes, the Darwin Initiative does not and nor do any of the research councils. Guidelines for proposals to the Darwin Initiative state: "The grant is offered as a contribution towards revenue costs. Payment of capital costs shall in most cases be no more than 10% of total costs, and only where necessary to enable the main work programme to be carried out. Whenever possible, Darwin funding will be used as a catalyst to lever additional funding for project work. This could be achieved through matched funding from the private sector, charitable organisations or other public sector schemes, in order to carry out additional work (during or beyond the project lifetime) and engage more stakeholders. Collaborating host country institutions will be expected, whenever possible, to contribute to the project costs. This may be in kind, for example through provision of staff time or facilities."

9. The Darwin Initiative is not an ideal model for the support of all development-related research. Institutes with core-funding such as Rothamsted Research or the Natural History Museum are better placed to benefit from BBSRC or Darwin Initiative grants, but institutes that lack any core-funding are not. An alternative model for aid programmes is that adopted by the management of the DFID Renewable Natural Resources Research Strategy (RNRRS) that has developed partnerships with scientists in developing countries so that the research is demand-led, involving networks of scientists, governments, NGOs and the private sector. The RNRRS also recognises the need to pay fully economic costs to the institutes that win its contracts.

10. UK institutes supported by the research councils do not always have the experience nor the network of integrated collaborators to provide the kind of scientific support that is essential for successful development science, exemplified by the successes of the RNRRS. If the UK's scientific institutes that have specialised on problems affecting developing nations disappear, then not only will sources of advice, technical co-operation and capacity building be lost to the developing world but DFID will no longer have a source of advice based on decades of experience. Indeed DFID have already shed the formal means that they did have for seeking such advice and this may explain why their current and planned future strategies concentrate on socio-economic approaches, with minimal scientific input. DFID still has no chief scientist.

#### *Looking ahead*

11. Prospect welcomes the statement by the Secretary-General of the United Nations, Kofi Annan, that his top priority is the application of science and technology to agriculture (see Nature of 12 February 2004) and draws the Committee's attention to his support for the establishment of a Global Institutional Fund to boost research efforts in poor countries. In our view, DFID should:

- Consider establishing such a fund of its own;
- Raise its aid budget to the proportion of its GNP recommended by the UN;
- Bring UK scientific capacity in developing country issues back into the public sector; and
- Stop encouraging developing countries to privatise their scientific capacities.

As shown by experience elsewhere, privatisation can exact a high price in terms of standards, diversity, commitment, flexibility and originality of research. Worse still, in the context of international development, it can lead to privation for the majority and privilege for the few.

March 2004

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## APPENDIX 90

### Supplementary memorandum from the Foreign and Commonwealth Office

1. *The Science and Technology Committee has asked, "How do you evaluate the effectiveness of the Chevening Programme?"*

Evaluation of Chevening Scholarships is based on scholar statistics, a departure questionnaire completed by scholars and an annual questionnaire completed by Posts. This process reveals that there are a large number of applications for Chevening awards, scholars' experience of the UK is largely positive, and Posts are in touch with over half the alumni who studied in the UK 10 years previously.

The FCO Scholarship Review, undertaken by independent consultants (River Path Associates), examined the FCO's investment in the Chevening Programme, the impact of this investment against FCO strategic priorities and ways to maximise the impact of this investment. It found that formal evidence for the impact of Chevening scholarships expenditure was sparse. The Review recognised that more effective assessment was required for Chevening.

In making changes to the Chevening Programme, scholarships will be focused primarily on countries of long-term strategic interest to the UK. Scholarships will be expected to have an effect on the profile of the UK and on that of UK higher education and on specific higher education institutions. Any longer-term benefit to relations will be an added bonus. The FCO is also introducing Chevening Fellowships in subjects of relevance to the UK's International Priorities. Fellowships will be expected to deliver returns in the shorter term and to have an ongoing impact on specific policy objectives at Post. Appropriate evaluation methods are being developed both for the academic scholarship and the professional fellowship streams of the Chevening Programme.

2. *The Committee has also asked, "Is there any intention to try to increase the proportion of Chevening scholarships in science and technology subjects?"*

Candidates for Chevening scholarships are assessed against three criteria: intellectual excellence, strength of study proposals and record of service to the sending country, indicating leadership potential. Successful candidates follow their own chosen course of study, subject to any limitations arising from priorities agreed under the terms of joint sponsorship. The FCO will remind Posts of the value of Chevening scholars in science and technology subjects in highlighting the UK's academic excellence in these fields, in promoting future business links and in fully exploiting the public diplomacy benefits that accrue to the UK when Chevening alumni receive prestigious scientific awards.

The FCO Scholarship Review examined proposals for new Chevening Science Scholarships. No recommendations were made on this point in relation to the Chevening Programme, and the Government subsequently announced the new Dorothy Hodgkin Postgraduate Awards. The FCO intends to continue to offer Chevening Scholarships in science and technology subjects.

3. By agreement with the Committee, we aim to reply by 7 June (Annex A) to its question about the proportion of Chevening awards devoted to PhDs, Masters or short courses in science, engineering and technology.

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### Annex A

1. *The Science and Technology Committee has asked "What proportion of the 156 Chevening awards made in science, engineering and technology subjects in 2002-03 were for PhD, Masters or short courses respectively? Have these proportions remained constant over time, or has there been an increase in the proportion of shorter courses at the expense of PhD studentships?"*

2. We replied to the first part of the question on 3 June and sought further time to make an answer to the second part of the question.



3. The proportions of Chevening awards made in science, engineering and technology subjects in the academic years (AYs) 2000–01, 2001–02 and 2002–03 were as follows:

<i>Course</i>	<i>AY</i>	<i>2000–01</i>		<i>2001–02</i>		<i>2002–03</i>	
		<i>Number (of 110)</i>	<i>%</i>	<i>Number (of 126)</i>	<i>%</i>	<i>Number (of 156)</i>	<i>%</i>
PhD		10	9.0	19	15.9	10	6.4
Masters		68	61.8	78	61.9	86	55.1
Short Course (six months or less)		3	2.7	13*	12.7	14	9.0

Note: the figures for 2000–01 are for Chevening core scholars only, excluding the smaller number of Chevening scholars under Central Jointly-Funded schemes, for which figures for the year are unavailable. The same caveat applies to the asterisked figure for 2001–02, which is a factor of the 102 Chevening core scholars for the year, as we do not hold details of the number of short courses among the 24 Chevening scholars under Central Jointly-Funded schemes for that year.

4. As these figures show, the proportions of Chevening awards made in science, engineering and technology subjects in these three years have not remained constant. But it is not easy to discern any particular trend, and specifically any increase in the proportion of shorter courses at the expense of PhD studentships.

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## APPENDIX 91

### Supplementary evidence from the Office of Science and Technology, Department of Trade and Industry

#### 1. How do you intend to evaluate the effectiveness of the Dorothy Hodgkin Postgraduate awards?

The “pilot” scheme will begin to be evaluated in July 2004 to assess how to take the scheme forward. This work is in progress but is likely to include an assessment of:

- quality of successful applicants from an assessment of their first degree attainment
- submitted versus successful applications (this will help to gauge demand and “hit” rate / marketing of scheme)
- take-up and successful completion of awards
- demographic profiles—by discipline, nationality, ethnicity, gender
- student views
- views of the Research Councils and private sector stakeholders
- views of participating universities on operational details
- alumni tracking eg careers taken up, return to country of origin

The evaluation will assess:

- the degree of return to countries of origin, and a career position in these countries
- the additionality—or value added—of the scheme in terms of the quality and number of PhD students deciding to study in the UK
- the success of the marketing of the scheme by the consequent take-up of the awards along with the geographical distribution of home countries
- the benefits to participants
- the benefits to scheme sponsors

The scheme will then be reviewed annually at “steady state” and lessons learned will be disseminated to others across government engaged in similar activities eg the FCO and its Chevening scholarships. Indeed, the recommendations of the Chevening Review will also be carefully considered.

#### 2. What steps are being taken to ensure that there is a constructive environment in which Dorothy Hodgkin graduates can apply their new skills when they return to their countries of origin?

These issues have yet to be defined and worked out, but ideas include

- active alumni to maintain personal (student-staff, student-student) collaborative links
- encouraging institutional links between sponsor and home institutions

- maintaining and building on these links where students remain in the UK to ensure that “brain drain” is converted to “brain bank”

OST seeks, through its bi-lateral and multi-lateral Ministerial, Royal Society, CSA and official level visits and meetings to take forward international science collaboration and to help to inform science and technology policies in partner countries. It seeks, through its bilateral relations, to facilitate research and commercial collaborations with those partner countries and has already established networking arrangements with India, China, South Africa to facilitate contacts between scientists in areas of mutual interest and benefit. There may well be opportunities to link successful Dorothy Hodgkin graduates with such networking schemes to maintain collaborative links and continuity of research of mutual benefit.

3. *What impact do you think DFID’s decision to untie research will have on the UK research base?*

DFID’s untying of research may well compromise the sustainability of the UK research base operating in areas of particular relevance to the developing world, and may serve to distance DFID from the Research Councils even further. The Research Councils have made it clear that they have significant expertise in many research areas relevant to international development that is not being utilised by DFID. This is likely to be exacerbated with the untying of research, unless there is some form of policy steer and/or commitment from DFID.

Untying research may also result in a disengagement of other potential UK players in capacity building exercises with developing countries.

Untying research may further undermine the UK research base in international development—in natural and social sciences—and thus our own capacity in this area. This would be contrary to global calls for global action—especially given that the UK has strong technical experience and leadership in critical development areas, eg agricultural R&D, biotechnology and medical research.

Untying research is likely to further distance policy interests between DFID and much of the rest of Government—whose interests are predominantly UK-centric, and would reinforce the arguably artificial division between British interests (and influence) and international development interests.

Nevertheless, the rationale behind untying is commendable in its strive for open competition and value for money. Much like the untying of aid, there may well be concern that other countries do not follow suit; in which case, UK research suppliers may be significantly disadvantaged.

4. *How is the current UK Government approach to science and technology capacity building aligned with wider EU, United Nations and World Bank policy on international aid? Is there a consensus on the appropriate balance between capacity building and short-term aid provision?*

This is really a question for DFID. But I think it is fair to say that (1) there is currently no clear UK Government approach to S&T capacity building so no alignment with donor agencies/multilaterals, and (2) there is no consensus on the appropriate balance between capacity building and short-term aid provision. The Select Committee Inquiry and the OST scoping study need to address these issues.

5. *In oral evidence you noted that “The budget for research and development in science, engineering and technology in DFID is £149 million a year. That, in itself, would demand a person [Chief Scientific Adviser] of the stature we are now discussing to see that the money is well spent” [Q247]. Can it be inferred from this that you believe that a DFID CSA should have control over research and/or other budgets?*

DFID’s internal finance arrangements are a matter for DFID and no such inference should be drawn. The important thing is that the DFID CSA should be of sufficient stature and experience to ensure that DFID’s research activities are relevant, focused, robust and appropriately evaluated—and in doing so provide value for money; and that the CSA should have direct access to the Secretary of State on all policy advice issues including capacity building in science and technology.

6. *In oral evidence you stated that “In the case of DFID we are currently looking at the third draft of their science and innovation strategy” [Q287]. Could you clarify whether this refers to the DFID research strategy being compiled by Paul Spray, Head of Research at DFID, and his team from the Central Research Department, or to another document with a wider remit that also encompasses issues such as the provision of scientific and technical advice to DFID and the leveraging by DFID of scientific knowledge and research results to promote innovation?*

DFID has consulted me on its Research and Innovation Strategy—now out to consultation. That strategy sets out the department’s policy over the bulk of the research undertaken by DFID and the plans that its central research department intend to pursue. It is therefore central to DFID’s future approach to science.

In my review of departmental Science and Innovation Strategies scheduled for later this year, I am assessing the quality and effectiveness of all the department's scientific work—including those items you set out in the latter part of your question.

May 2004

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## APPENDIX 92

### Supplementary memorandum from the British Council

#### Question 1: *Future of the Higher Education Links (HEL) scheme*

On 12 May, Hilary Benn, the Minister for DFID, announced a new HEL scheme. The scheme will start in April 2005, with funding of £3 million a year, and continue until 2012. Announcement of the new scheme set off a three-month consultation period. The lead person in DFID for the HEL scheme is David Levesque. Their current thinking is that there should be more links in science and technology and more for sub-Saharan Africa. Further details are available on DFID's web site, under "funding".

#### Question 2: *Trends in S&T Higher Education Links*

I attach a table at Annex 1 showing the number of S&T links by subject area, for the period April 1997 to March 2006. The last year in which new links were approved under the old scheme was 2003–04, hence the drop between 2003 and 2006.

#### Question 3: *Evaluation of the Higher Education Links scheme*

The aim of the scheme is to build links in areas of innovative work, using relatively small sums of money. In the short-term, for individual links, the two project leaders submit an annual report, which is checked against the original terms of reference by the in-country link manager. In the medium-term, country missions by CICHE, with membership drawn from DFID, BC and the UK vice-chancellors, are mounted every 18 months to different countries, with a view to examining and improving impact. The longer-term question, of how such innovative work will be sustained afterwards, is examined through periodic DFID-funded external reviews. At Annex 2 I attach a table detailing evaluation missions to specific countries that took place between 1982 and 2000, and, at Annex 3, details of the five last reviews commissioned by DFID.

#### Question 4: *British Council's headcount in science*

In 2001–02, the British Council had 52 full-time equivalent staff working in science, engineering and environment, operating out of 36 countries. In 2003–04, the number had risen to 84 full-time equivalents, operating out of 62 countries. Depending on one's classification of "developing countries", the Council operates science programmes in 12 developing countries (as opposed to "transitional" or "developed" countries). The Council does not undertake centrally-driven audits of professional qualifications, preferring to devolve selection on the basis of generic and job-specific competencies, including strategic thinking, relationship building, entrepreneurship and scientific literacy.

#### Question 5: *Statistics in the Council's publication "Vision 2020"*

The figure for the number of international postgraduates in the UK in 2003 was 112,000, compared to 126,000 undergraduates. Of those 112,000 postgraduates, 35,000 did postgraduate research and 77,000 undertook postgraduate taught courses. The predicted growth to 2020 for postgraduate taught courses is 6.3%, and for research is 4%. I apologise for previously misquoting the figure of 77,000 taught postgraduates.

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## NUMBER OF HIGHER EDUCATION LINKS IN SCIENCE AND TECHNOLOGY 1997–2006

<i>Subject Area</i>	<i>Apr 97– Mar 98</i>	<i>Apr 98– Mar 99</i>	<i>Apr 99– Mar 00</i>	<i>Apr 00– Mar 01</i>	<i>Apr 01– Mar 02</i>	<i>Apr 02– Mar 03</i>	<i>Apr 03– Mar 04</i>	<i>Apr 04– Mar 05</i>	<i>Apr 05– Mar 06</i>
Botany	2	2	1						
Biochemistry	4	3	4	3	3	3	1		
Biodiversity/Ecology	6	3	4	3	3	2	2	1	1
Biological Sciences	6	4	3	4	5	7	6	4	2
Biotechnology	6	3	2						
Chemical Engineering	3	3	4	4	4	3	1		
Chemistry	3	3	2	1	1	1			
Civil Engineering	5	5	6	6	6	7	5	1	
Coastal Management/ Oceanography	3	4	3	3					
Ecology	6	4	2	1					
Earth Sciences	3	6	6	5	6	3	3	3	
Electrical and Electronic Engineering	7	5	3	3	3	1	1		
Environment Engineering	4	3	2	4	5	5	3	1	
Environmental Science/ Studies	25	23	25	24	39	37	31	20	6
Fibre Optics	1	1	1	1					
Food Science and Technology	8	6	11	10	12	11	5	5	2
General Engineering	5	5	3	4	4	2	1		
Genetics			1	2	3	4	3	2	1
Horticulture/Plant Pathology	3	5	5	2	2	2	2	1	
Industrial Manufacture/ Technology	7	4	3	1					
Information Technology	7	5	6	6	7	5	3	2	
Marine Biology	5	8	9	7	7	7	7	6	5
Mechanical Engineering	4	2	1						
Metallurgy and Materials	4	2	2	1	3	2	2	2	
Meteorology/Climate Change	2	1							
Microbiology/Molecular Biology	3	4	4	3	3	1			
Mineral and Mining Engineering			1	1	1	1			
Organic Chemistry		1	1	1	2	1	1		
Pollution Control	10	7	5						
Physics	6	5	2						
Physiology		1	1	1	1				
Renewable Energy	3	4	3	5	4	3	3		
Science Education	3	3	2	1	1	1			
Textile Industry		1	1	1	2	3	3	2	1
Town and Country Planning	3	2		1	4	5	5	4	1
Urban Regeneration	1	2	3	4	7	5	5	4	
Veterinary Science	6	6	6	4	4	4	4	3	1
Vocational Training	3	3	4	4	4	4	2	1	1
Water Resoures/Management/ Treatment of wastewater	15	18	21	20	19	18	11	7	7
Zoology	1								
<b>TOTAL</b>	<b>182</b>	<b>167</b>	<b>163</b>	<b>141</b>	<b>165</b>	<b>148</b>	<b>110</b>	<b>69</b>	<b>28</b>

## Annex 2

## CICHE MISSIONS

<i>Dates</i>	<i>Mission to</i>	<i>Number of Persons</i>
1–19 January 1982	Ethiopia, Kenya, Tanzania and Uganda	2
9–15 January 1983	Zimbabwe	2
2–7 January 1984	Mauritius	2
10–14 June 1985	Ethiopia	2
1–10 May 1986	Nigeria	5
1–7 April 1987	Mauritius	2
28 February–5 March 1988	Egypt	2
September 1988	Finland	3
April 1989	Indonesia	4
May 1989	Soviet Union	6
June 1989	Switzerland	3
November 1989	Ireland	3
26 February–10 March 1990	Sudan	4
March 1990	Denmark, Sweden	3
March 1990	Belgium, Luxembourg, Netherlands	3
25 to 30 March 1990	Korea	4
7–18 May 1990	Malaysia	4
8–18 September 1990	Hong Kong	5
December 1990	Argentina	5
9–15 December 1990	Czechoslovakia	6
January 1991	Thailand	3
7 January–2 February 1991	Italy	6
3–9 March 1991	Hungary	5
6–10 May 1991	Greece	3
13–17 April 1992	Zimbabwe	3
April 1992	Portugal	3
May 1992	Brazil	4
9–13 November 1992	Caribbean	4
13–26 February 1993	South Africa	3
September 1993	China	4
19 February–2 March 1994	Nigeria	4
23 April–2 May 1994	Egypt	3
11–17 December 1994	Brazil	3
March 1995	Mauritius	2
8–12 May 1995	Eritrea and Ethiopia	2
24–30 November 1996	Indonesia	7
30 November–11 December 1998	India	4
28 February–10 March 2000	Tanzania, Uganda and Zimbabwe	9
19 November–25 November 2000	Cuba	8

## Annex 3

## LIST OF EVALUATIONS OF HIGHER EDUCATION LINKS SCHEME COMMISSIONED BY THE DEPARTMENT FOR INTERNATIONAL DEVELOPMENT

1. “Report to the Overseas Development Administration: Evaluation of Academic Links”. Dr C Hassall (October 1990).

2. “Review of the Higher Education Grant”. Roger Iredale, Chief Education Adviser (June 1992).

3. “Cost-Effectiveness Study of Higher Education Links”. Professor James Hough (June 1996).

This review examined cost-effectiveness, as per the title, rather than other issues, and concluded that “The FICHE grant is very cost-effective and gives very good value for money, not least because of the large built-in multiplier effects”.

4. “Evaluation of the Higher Education Links Scheme”. IDPM team (Derek Eldridge, Dr David Mundy, and Dr Elisabeth Wilson) (May 2000).

This review looked at the impact of the HE Links on DFID's development goals but also touched on long-term impact. The executive summary (point 5) noted "In terms of longer-term economic and social development through influence on policy, practice and decision making at the highest levels, the context for the Links scheme must be emphasised. Links are small-scale on the whole, many of their influences are well downstream, and while a large proportion of links claim they will make this type of impact, there are few verifiable indicators available to show the level of progress made. However, a number of links investigated in this evaluation have had impacts on policy and practice, producing major shifts in thinking such as health service delivery and in environmental protection. We have no reason to believe that other links that claim to influence policy, practice and decision making will not achieve their purposes"

5. "The Higher Education Links Scheme: Review and Possible Future Options for Higher Education Partnerships". Terry Allsop, Paul Bennell and David Forrester (March 2003).

The executive summary (point 8) notes one perceived weakness of the scheme is any mechanism for ensuring sustainability. The recommendation is that this should be addressed if a new programme comes into being. However (point 13), any new scheme would need to recognise a key reality, that "the success of any support arrangements depends on their sustainability. This may lead to concentrating efforts where the conditions for such sustainability exist ie where there is an effective local infrastructure & the political will for reform (and this may exclude some countries in sub-Saharan Africa where conditions are not favourable). The report recommends that a greater use be made of replicating best practice and creating networks of institutions.

## APPENDIX 93

### Supplementary evidence from the Natural Resources Institute, University of Greenwich

#### FIRST QUESTION

With regard to redundancy payments, the University incurred costs of £7.5 million as a result of the major NRI down sizing in August 2001. An additional £0.4 million in voluntary severance payments for under commissioned staff has been incurred since that time. The annual changes in NRI professional staff between 1996 and 2003 were as follows:

<i>Year</i>	<i>Number of Staff</i>
1996	228
1997	235
1998	226
1999	228
2000	216
2001	119
2002	105
2003	82

#### SECOND QUESTION

The Consultative Group for International Agriculture Research (CGIAR) is by the nature of its mode of operation (ie over 60 donors/members coming together in a voluntary capacity to support a common development goal) a unique approach to research commissioning. It has produced some excellent research outputs over the 30 years of its existence and, in principle, deserves DFID support in the future.

As pointed out in our earlier submission, the CGIAR is particularly strong on germplasm research and the development of high yielding varieties of commodities such as maize, rice and wheat. It has had less impact in areas of natural resources management, social sciences, economics and policy, and in key commodities of major importance to the international trade. Further, the major impact of the CGIAR has been in Asia and it has had very much less impact in Sub-Saharan Africa.

To a large extent the CGIAR is still operating on the "1970s" model of agricultural research institutes in which there is a fixed infrastructure and staffing complement which can, over time, become a constraint to the institution's evolution and development. An example of this is the fact that there are very few social scientists in total in the CGIAR system and the few that are tend to be economists rather than social development specialists. This is the case, despite the fact that poverty elimination is a key objective of the CGIAR. Also, despite arguments to the contrary, the 16 CGIAR centres still exist with a high proportion of core funding usually around 50–60%. Although undoubtedly funding for the CGIAR system as a whole has been more difficult to attain in recent years, there is still no real mechanism to ensure that the CGIAR

provides value for money for its services in relation to other possible research suppliers such as national agriculture research institutes in developing countries or (so-called) advanced research institutes in developed countries.

The UK scientific community was heavily involved in the establishment of the CGIAR and there has been a long and distinguished record of support and partnership from the UK science base. There remain research sectors where the UK has a global comparative advantage but for which, unlike the CGIAR, no core support is provided to maintain capacity. An example of this is in aspects such as crop protection and crop post-harvest where organisations such as NRI excel but the CGIAR has limited capacity. Over the past few years, NRI and other UK institutions have provided significant expertise in crop protection and crop post-harvest through partnership arrangements with CG centres often supported through the UK's bilateral research funds. These arrangements are much valued but are becoming more difficult for UK institutions to enter into.

We do not argue for all-out competition for the funds which currently are invested in the CGIAR. The experience of the last few years has demonstrated that micro managed small competitive research funds may not be the most efficient system either for customer or contractor. However, we do argue for a level playing field in terms of the buying of services offered by the different players. Whilst we argue that the CGIAR has a continuing place in the global agricultural research system, it should be seen as one that carefully complements the other players and in particular the national agriculture research institutes in the South and the advanced research institutes in the North. We contend that at the current time the playing field is uneven to the extent that DFID is moving to provide core funding to the CGIAR and in part this will involve the CGIAR moving into areas of research where the UK, and NRI in particular, claim a global comparative advantage. This we feel is unfair and is not a good use of DFID funding.

The CGIAR Challenge Programmes established in the late 1990s were designed partly as a means of addressing this issue. The principle of Challenge Programmes is to attract funding from a range of sources to allow agricultural research to be undertaken to resolve discrete developmental problems. Once sufficient funding is available, this is used to commission the most appropriate Organisation (almost certainly including CGIAR centres but also developing and developed country research centres) in a form of partnership. However, in reality for the three pilot programmes that are currently established, most of the money is being retained by the CGIAR and indeed in some cases there have been barriers to entry for developed country institutions in terms of their access to competitive funds. One such barrier is the ability to provide co-financing.

### THIRD QUESTION

The third question, concerns DEFRA's Climate Prediction Programme contract with the Hadleigh Centre. We are not familiar with the details of this particular question and are therefore not able to offer a specific response. We are, however, able to respond to the general principles involved.

In practice, capacity building (both human and physical capital) in developing countries is an integral part of all DFID research programmes and certainly has been a major plank of the research carried out through the Renewable Natural Resources Research Strategy. We could offer many examples where individuals and institutions have been developed as a consequence of the relationship with NRI through a DFID funded project.

There has, however, been a conflict within DFID concerning the extent to which funding from its *research* programmes should be used to build capacity in developing countries when strictly speaking institutional capacity building of institutions in the South falls under the responsibility of its appropriate bilateral *development* programme/geographic desk. This division has been blurred by allowing research programmes to fund sufficient capacity building activities to allow the efficient and effective undertaking of the particular research under consideration but this is not a very satisfactory situation.

Another generic issue concerns joined up Government; the issue of climate change is area where there is a particular need for joined up thinking between Government departments and it is not clear what mechanisms DFID in particular has for this. Further, if UK taxpayers' money is being used through DEFRA and the Hadleigh Centre to support capacity building in developing countries, has it been decided that this falls outside the International Development Act? If so, has DFID applied the rigours of the Act too strictly with respect to research and capacity building more generally?

May 2004

## APPENDIX 94

**Memorandum from the Royal Society of Tropical Medicine and Hygiene (RSTMH)**

## INTRODUCTION

The RSTMH is a professional body with an active programme in tropical medicine and international health in poor countries over the last 100 years. It holds research meetings at which recent advances in research, policy and practice are presented and discussed with a focus on ways of improving the health of people in less developed countries (LDCs).

Historically the RSTMH has concentrated on biomedical and clinical aspects of health in tropical countries and fellows have played key roles in advising in the UK government on research developments through working groups of DFID (particularly through the previous Health and Population Division), British Council, MRC, DFID offices overseas and directly to DFID UK. In recent years the RSTMH has fostered research including cross cutting issues such as assessment of the impact of multi-sectoral programmes, health financing and novel delivery systems. A member of DFID is a co-opted member of the Council of RSTMH is able to feedback directly to DFID as a result of the input of the 2000 Fellows, many of whom are full time researchers on projects in international health, both in the UK and overseas. While the majority of Fellows are based in the UK and other European countries, a substantial proportion are based in Africa, Asia, Middle East and South America.

The RSTMH was invited to contribute to the establishment of DFID health research priorities at a joint meeting between DFID and RSTMH on 15 November 2003. The Council of RSTMH also addressed the specific questions outlined in the press notice dated 21 July asking for written submissions to the Science and Technology Committee.

1. *The co-ordination of research support government policy on the use of science in development policy, taking into account the work of the research councils and the objectives of HM Treasury, DTI, OST, FCO, the British Council and DFID.*

DFID has a strong record in promoting international health research and feeding the results into its own policies and that of other development agencies and national governments. In recent months, DFID has emphasised that it seeks to focus its research inputs to address the key Millennium Development Goals. These are available on [www.developmentgoals.org](http://www.developmentgoals.org). Thus research support by DFID will focus on:

1. eradication of extreme poverty and hunger;
2. achieving universal primary education;
3. promoting gender equality and empowering women;
4. reducing child mortality;
5. improving maternal health;
6. combatting HI V/AIDS, malaria and other diseases;
7. ensuring environmental sustainability; and
8. developing a global partnership for development.

The UK government support for research in health has mostly been through the DFID work programmes, the majority of which last for five years. These are awarded to key university groups within the UK who partner with overseas researchers, the MRC and particular the work in The Gambia and Uganda. In addition the UK government supports research at the NIMR through its country offices overseas, DFID supports individual, locally initiated research activities.

The focus on high priority issues such as malaria, HIV/AIDS and TB has been clear through the previous Health and Population Division of DFID. The recent reorganisation of DFID into 20 subject areas makes it a challenge to know how research is going to be organised in the future. Indeed the central research policy team of DFID is writing its research policy in preparation for submission before the end of 2003. The RSTMH is contributing to this process with many suggestions in order to ensure that key focused research initiatives are not dropped or omitted during the review and reform of DFID research policy. It is too early to know what the impact of the review of the research policy will have on co-ordination and the use of science in its development policies but serious concern has been raised by RSTMH that the total research budget is almost zero for 2004 and only £70 million for 2005. The proportion allocated for health has not been confirmed. Some of the comments included in this report refer to the ways in which research findings have been incorporated in policy in the past and others refer to ways in which it might be incorporated in the future uncharted structure of DFID. The British Council has played a key role in enhancing the capacity of science and research institutions including universities and government bodies in LDCs in the past. However, its policies in recent years towards more programmatic and management issues in which it takes contracts for merging health programmes and the emphasis on shorter vocational training for scientists and programme managers in country, has led to a decrease in the number of professional scientists being trained for higher degrees. A major problem in many LDCs is the small number of doctoral scientists available to make considered assessments and reviews of science in relation to their own national development policies



and to interact with DFID officers. DFID has an extensive range of health and development offices in many LDCs. They are able to become informed through its own system of communication but RSTMH expresses great concern about the decline in fellowships for doctoral scientists (clinical, public health, basic and social) who are being trained as a result of DFID/FCO fellowships through British Council.

*2. The means by which DFID acquires and uses scientific advice in developing and implementing its policies and programmes.*

In the past DFID had advisory groups on key topics such as Malaria, TB, HI V/AIDS and Nutrition in which scientists from the UK and other industrialised countries and from LDCs were able to give inputs and how they would influence cost-effective programmes of aid and development. Indeed the emphasis that DFID is putting on the Millennium Development Goals is a reflection of the key areas in which scientific developments have been most productive over the years. Uses of web sites, journals and newsletters now inform DFID of the knowledge base available for its policies and a previous document “Better health for poor people” was a good example of ways in which recent science had been incorporated within international policies.

RSTMH notes with concern that there is no obvious means by which DFID policy is supported by scientists within DFID as the role of technical advisers is considerably less than in previous years. Nevertheless, the Central Research Policy Team of DFID is interacting with scientists through the RSTMH/DFID meeting and the recent DFID HIV consultation is a good example of how DFID staff are identifying missing areas of research and using established research. How much this research is influencing current DFID policy is not clear because of the recent changes in its structure.

*3. Extent to which investment in research and the promotion of innovation plays a part in DFID’s country level development programmes.*

While DFID has a generic “pro-poor” policy, and focuses on the MDGs at a central level, it gives some degree of flexibility for its country level programmes to respond to national government initiatives where the two organisations are in agreement on priorities. While some of the DFID research programmes have fellowships, RSTMH notes that the level of funding for institutional capacity building, including staff training, core facilities for science laboratories and laboratory equipment is very low. National research organisations often struggle to develop a strong long term science base. The problem that LDC scientists note is the short term nature of funding, three to five years in most situations. Whereas the MRC has had productive investment through long term support in Uganda and The Gambia, these do not support national government or university research. There are few if any examples of DFID’s long term support of science in developing countries. This contrasts with the longer term support of some of the European and North American donors.

*4. The progress of UK’s efforts to build scientific technological and engineering capacity in developing countries to help them overcome trade restrictions and the co-ordination of these efforts with NGOs, charities and international programmes.*

British science has a leading reputation for innovation in working with NGOs, charities and international programmes such as Unicef, FAO and WHO. The ability of British universities to attract funds from prestigious international funding organisations such as Gates’ Foundation and international private and charitable organisations is outstanding. The willingness of UK research organisations to develop the capacity of science in LDCs is impressive and there are many innovative ideas, but many of which are unable to come to fruition because of lack of funds. In recent years there have been productive examples of UK university/NGO research, particularly in the area of treatment of severe malnutrition, malaria and the prevention of improved prevention and management of HIV/AIDS.

*5. The ways in which the role of the UK private sector and public/private partnerships in science and technology research in knowledge transfer and in capacity building programmes for the benefit of developing countries can be enhanced.*

While the British Council has reduced the number of fellowships available for scientists from LCDs, its programme of exchanges between universities has been successful. This enables scientists from the UK to visit others in LDCs for two week periods and vice versa. These enable grant applications to be written to various funding bodies, some of which have been supported by DIFD and there are good examples of public/private partnerships linking UK universities with South Africa for instance.

RSTMH notes the considerable opportunities there are for such programmes. The UK private sector could finance exchange of scientists. The largest financial player in the health sector is probably the pharmaceutical industry. Their efforts have been focused on reducing the price of generic drugs for patients in LDCs however. The private sector in the UK has considerable potential for linking with universities on development of science base in LDCs. RSTMH notes that consortia between industry and national funding

organisations such as the National Institute of Health in the US has considerably increased the financial support for science in LDCs. The UK has a pivotal role to play here in view of the strong track record that DFID has for supporting research in the past. RSTMH suggests that DFID could develop a key consortia in relation to private/public partnerships to support research in the UK in association with strategic research organisations in LDCs. RSTMH is concerned that much of development aid from DFID is now put into "basket funding" to ministries in LDCs and consortia such as the Global Health Fund without any provision to develop and support research.

*6. The extent of scientific training provided by the UK as part of development policy and the subsequent utilisation of such training in developing countries.*

Not all training provided by the UK has been successful in terms of national capacity building. In previous decades, clinicians supported by UK funds came to the UK for specialist training. A disappointing number of them returned, or if they did, they used their skills in private practice rather than for the development of research. RSTMH notes however that the disappointment of this outcome has been followed by a decrease in the number of fellowships. RSTMH notes that DFID does not encourage the development of science (basic, public health and social methods of training). DFID appears to support what is already known rather than supporting research on health problems which are presently unsolved. RSTMH recommends that greater support is given to individuals and their departments in LDCs. This would provide an intellectual training which enables them to contribute to the review and reform of policies, health and development in LDCs. There is a serious lack of such people in LDCs at the present time. Despite the decreasing support from DFID and British Council, UK universities have been innovative in the last five years, developing new masters programmes, some taught by distance learning. Other constraints facing such people in applying the knowledge that they have achieved is the poor infrastructure and salary rewards for staying in science in LDCs and if the equipment is lacking it is almost impossible for well trained scientists to perform adequately. RSTMH notes the potential for investing in key focused universities and attracting a critical mass of investigators from selected countries/regions. A key part of training in the UK is provided by charities such as the Wellcome Trust which funds scientists to work in LDCs and to support national investigators as they introduce new technologies and studies in research partnerships. The Wellcome Trust schemes for support of clinical tropical medicine have been very successful. DFID used to fund such schemes but has withdrawn these. RSTMH notes that the enormous enthusiasm and commitment by UK universities towards research on international health and development issues will only be sustained if the UK government supports the development of science in these areas within certain UK universities.

*7. The future?*

It is clear from the attached document from the RSTMH/DFID meeting (not printed), that UK scientists have enormous capacity, knowledge, expertise, experience and enthusiasm for supporting their colleagues in LDCs and the use of science UK international development policy. RSTMH notes that a number of the MDGs will not be achieved, despite strong international commitment by the UK government. There are opportunities for innovation. UK scientists are involved in a wide range of programmes. It is not yet clear whether DFID's own international development policy will take advantage of the richness of the UK's science resource.

November 2003

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## APPENDIX 95

### Supplementary memorandum from the Department for International Development

#### PLANNING HUMAN RESOURCES FOR HEALTH WORK IN MALAWI

The current level of staffing in Malawi's health service is inadequate to maintain a minimum level of health care. Staffing is also inadequate to roll out Anti-Retroviral Treatment (ART) and other HIV/AIDS related services. Malawi has been unable to train enough health sector staff to meet needs for some years due to fiscal constraints. HIV/AIDS-related attrition among health sector staff compounds this shortage. Much of the investment made in training is being lost as increasing numbers of professional and technical staff chose to move out of public health service.

To address this problem, the Ministry of Health proposes eight areas of action. Most urgent among these are:

- (i) emergency external recruitment of physicians;
- (ii) providing incentives for recruitment and retention of Malawian staff; and
- (iii) a significant expansion of domestic training capacity.

DFID has taken a lead in supporting Ministry of Health efforts to refine and determine the financial implications of its "Proposed 6-Year Human Resource Relief Programme for the Malawi Health Sector". The cost of the proposed programme has been initially estimated as approximately \$270 million. Of this, approximately \$186 million is required to finance staffing of selected HIV-AIDS related services, such as national roll-out of Anti-Retrovirals, provision of Voluntary Counselling and Testing, treatment of Opportunistic Infections and Prevention of Mother to Child Transmission. Coordinated support from multiple donors will be necessary to assist the Ministry of Health meet the challenge of improving human capacity in the health sector.

**Table 1**

## STAFF PER 100,000 POPULATION

<i>Cadre</i>	<i>Botswana</i>	<i>South Africa</i>	<i>Ghana</i>	<i>Tanzania</i>	<i>Malawi</i>
Physicians	28.7	25.1	9.0	4.1	1.6
Nurses	241.0	140.0	64.0	85.2	28.6

**Table 2**

## CURRENT AND REQUIRED HUMAN RESOURCES (MINISTRY OF HEALTH &amp; CHRISTIAN HEALTH ASSOCIATION OF MALAWI—CHAM\*)

<i>Cadre</i>	<i>MoH target cadre for Malawi</i>	<i>Current number in post</i>	<i>Current vacancies</i>
Physicians	433	139	<b>294</b>
Nurses	8,440	4,717	<b>3,723</b>
Clinical Officers	1,405	942	<b>463</b>
Medical Assistants	1,500	718	<b>782</b>
Laboratory Technicians	507	251	<b>256</b>
Pharmacists	285	93	<b>192</b>
Environmental Health Officers	1,662	304	<b>1,358</b>

\*CHAM provides approximately 30% of healthcare in Malawi

**Table 3**

## HUMAN RESOURCE REQUIREMENTS FOR SELECTED HIV/AIDS RELATED SERVICES (2005–10)

<i>Cadre</i>	<i>ART related staff</i>	<i>VCT related staff</i>	<i>OI related staff</i>	<i>PMTCT related staff</i>	<i>TOTAL</i>
Physicians	10	nil	nil	nil	<b>10</b>
Nurses	211	167	2,813	210	<b>3,401</b>
Clinical Officers	221	nil	468	nil	<b>689</b>
Medical Assistants	nil	nil	500	nil	<b>500</b>
Laboratory Supervision + Assistants	8	378	nil	nil	<b>386</b>
Pharmacists + Assistants	116	nil	nil	nil	<b>116</b>
Environmental Health Officers	10	nil	nil	nil	<b>10</b>

September 2004