Royal Society response to the House of Commons Science and Technology Committee Inquiry into the Use of Science in UK International Development Policy

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This document is the Royal Society submission to the House of Commons Science and Technology Committee Inquiry into the Use of Science in UK International Development Policy[1]. The order of the response follows the questions, which are highlighted in bold, raised in the committee's evidence invitation.

This response has been approved on behalf of the Council of the Royal Society by Professor Dame Julia Higgins FRS, Foreign Secretary and Vice-President. It has been prepared in consultation with the Royal Society Scientific Unions Committee, the national IGBP committee and the following Fellows and leading experts; Professor John Ball FRS (Mathematical Institute, University of Oxford), Dr John Gash (Centre for Ecology and Hydrology, Wallingford and Chair of the UK IGBP), Dr David Grimes (Department Meteorology, University of Reading), Stephen James (Rothamsted International), Professor John Lawton FRS (personal submission), Professor Barry Smith (British Geological Survey), Professor Steve Sparks FRS (Department of Earth Sciences, University of Bristol), Professor Brian Spratt FRS (Department of Infectious Disease Epidemiology, Imperial College London), Sir Magdi Yacoub KB FRS (National Heart and Lung Institute, British Heart Foundation).

Summary

With regard to technical and scientific matters, international development policy is currently not well joined up within the UK Government. DIFD 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.

[1] http://www.parliament.uk/parliamentary_committees/science_and_technology_committee/sci210703a.cfm

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 2001/2002 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 2004/2005 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 eleven 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 though 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 to 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 Mathematical Sciences (ICMS) 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.

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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 2004/2005, but we are hoping to introduce new projects to this programme.

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 S 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.