

The Foundation for Science and Technology, March 21st

"Stark choices for development policy - what should the balance be between building institutions, direct support and capacity building?"

"Building Innovation Systems"

Gordon Conway, Chief Scientific Adviser, Department for International Development

At the Foundation meeting on November 15th we had a thorough discussion of the role of Chief Scientific Advisers. I do not wish to repeat what was said then, except to emphasise my particular role at the Department for International Development.

I was appointed just over two years ago as the first CSA in the Department. I have a similar function to other Departmental CSAs. However my focus is distinctive in that it centres on science, technology, engineering and innovation as they are relevant to the needs of the developing countries.

Since my appointment this agenda has been increasingly prominent; for example in the report of the Commission for Africa in 2005, at the EU and G8 summits of 2005, in the DFID White Paper of 2006 and, most recently, at the Assembly of the African Union in Addis Ababa in January of this year.

The 2006 International Development White Paper; "*Making Governance Work for the Poor*" has committed DFID to doubling our funding for research, especially for better drugs and treatments, cleaner water, increased agricultural production and managing climate change, to some £220 million by 2010. This will make us one of the biggest development science donors in the world.

Our overriding objectives are to help a group of partner developing countries attain the Millennium Development Goals (halving poverty and hunger, greatly reducing child and maternal mortality etc.) by 2015 and achieve sustained economic growth. Our partners predominantly include fragile states (such as Afghanistan, Sierra Leone and the Democratic Republic of Congo) and Low Income Countries (such as Kenya, Uganda and Malawi). We also have more limited engagement with Middle Income Countries (such as Vietnam and Indonesia) and the so-called BRICS (Brazil, Russia, India and China).

Needless to say each of these categories of country presents different challenges in terms of building science and innovation capacity. In particular the stark choices that we are asked to address are likely to be differently weighted.

In my remarks I am not going to address the choices directly but instead make the argument that the choices depend critically on the creation in developing countries of national innovation systems. It is this context – the existence or potential for such systems and their form – that the choices for developing countries, and therefore for the international donor community in responding to that demand, have to be made.

First and foremost, I would argue, there has to be a clear policy decision at the highest level by national governments to develop science and innovation strategies. The recent statements by African presidents following the Addis Ababa Summit suggest that this is beginning to happen. A good example has been the development of a science and technology strategy for Rwanda.

Elements of Rwanda's Science and Technology Strategy

Under President Kagame's leadership the key driver for Vision 20/20, Rwanda's long-term national development plan, is the introduction of S&T into all elements of Government with the goals of helping to:

- stimulate a steady growth in GDP,
- advance the quality of life for all the citizens
- improve skills and knowledge among the population and
- integrate Technical Education with commerce, industry and the private sector in general.

Rwanda is focusing on developing high value added export industries in such fields as coffee, roses and pyrethrum. The new industries are based on subsistence farmers but the leadership in several instances comes from members of the Rwanda Diaspora who provide 'technological know-how, marketing and organisational savvy, and workforce training.'

Rwanda is now seeking to incorporate science and innovation in the development of its Poverty Reduction Strategy Plan.

A key to success is for developing countries to become intelligent users of science and innovation. This has several aspects. First policy makers have to foster and embrace a climate of intelligent use of science and technology.

Intelligent Users: The Key Skills

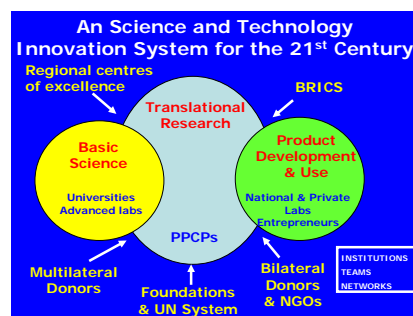
- The ability to ask the right questions;

- Set these questions in the appropriate context;
- Knowing where to seek answers;
- Interpreting the answers; and
- Putting them into effective practice.

Second they need to build the capacity to:

- acquire and use existing knowledge
- produce and use new knowledge
- ensure it is available in an affordable form

This, in turn, requires they connect with the large number of well funded innovation systems that are emerging as important global players.



A Global Innovation System for the 21st century (PPCPs are Public-Private-Community Partnerships; the BRICs include Brazil, Russia, India, and China)

A good example of such a global innovation system is the development of insecticide treated nets for use in the control of malaria.

Insecticide Treated Nets (ITNs) to Control Malaria

Today, the most effective control of the *Anopheles* mosquitoes that carry malaria is to use bed nets treated with a pyrethroid insecticide. Their development began with work by the UK Medical Research Council's Laboratory in the Gambia in the mid 1980s. Village trials demonstrated that bed nets dipped in insecticide resulted in a 63 per cent reduction in deaths of children under five years. Subsequent large-scale trials in northern Ghana, coastal Kenya and the Gambia showed a similar effect.

These findings led to more efficient treatment of the nets, including 'dip-it-yourself' kits, more durable nets and finally nets where the fibres are coated with an insecticidal resin and hence last for 4-5 years without the need for re-dipping.

Since 1998, insecticide-treated nets (ITNs) have been used in the Global Malaria Programme with great success. But use varies from country to country. The relatively high cost is a limiting factor.

This is now being overcome by programmes such 'Social Marketing of ITNs (SMARTNET)' in Tanzania. Nets bundled with re-treatment kits are available in even remote places at \$2 each. There is also a National Voucher Scheme that targets pregnant women and infants, and provides free nets for the poorest. Social marketing is used to run press and media campaigns and to organise displays at traditional rural markets. Some 3 million nets a year are being sold in Tanzania.

The innovation was truly global in extent

- critical were the research partnerships between MRC, the World Health Organisation (WHO) and the Wellcome Trust
- so were fundamental developments in science and technology, notably the development of safe, photo-stable pyrethroid insecticides
- and a crucial international dimension - in Tanzania the ATZ factory employs Chinese engineers, and uses resin from ExxonMobil in Saudi Arabia and Japanese insecticide technology from Sumitomo to produce the long lasting impregnated nets.
- plus funding from a wide range of international donors, including DFID.

There are large numbers of similarly configured global innovation systems out there. Some are huge – the development of an HIV vaccine for example, others are small, the development of new varieties of cassava.

In many respects they are like ocean liners, criss-crossing the seas. For the developing countries the challenge is to get on board, have access to what is being produced, be able to judge what is appropriate for their needs, and maybe get into the 'engine room' and help steer the ship in a more productive direction.

To do this developing countries need to build their own national innovation systems – complete with appropriate policies, a complement of entrepreneurs, a skilled workforce and well developed institutions of research and education.

I believe that the choices between building institutions, direct support and capacity building can only be done in this context. Moreover it is likely to be country specific. For example we know quite a bit about the national innovation needs of MICs and BRICS but what are needs of LICs and Fragile States? In particular how do you build up from a weak start? There are important 'chicken and egg issues' here.

I believe that we and our developing country partners are embarking on a new and exciting journey. I would welcome inputs to our thinking and our practice.