

**Report of a UNESCO “Expert Workshop on Science and Technology,
Innovation and Development” held at the
Manchester Institute of Innovation Research, University of Manchester,
27-29 February 2008**

“The main lesson for me is that much still needs to be done to disseminate the findings of research into Science, Technology and Innovation to the Development community and to synthesise these findings with the existing knowledge within that community.”

John Barber, in correspondence after the workshop.

The Manchester Workshop

An expert workshop, supported by the United Nations Educational, Scientific and Cultural organisation (UNESCO) and coorganised by UNESCO and the Manchester Institute of Innovation Research (MIIR), was hosted by MIIR at the University of Manchester from 27-29 February 2008. The focus of the workshop was the role of science, technology and innovation in development, with a particular focus on international development. This brief report has been prepared as an outline of what was discussed at the Workshop, who participated in the Workshop, and what was concluded and recommended as results and actions arising from the Workshop.

The Manchester Institute of Innovation Research is the world’s leading centre for research on the management of science, technology and innovation with over 50 staff researching in the field and a world leading number of research papers in the field. The Institute is located in Manchester Business School of the University of Manchester, and acted as hosts for the three day workshop. UNESCO is the specialised UN agency with a particular mandate and responsibility for education, science (natural and social sciences), culture and communications. In the Natural Sciences, there is a focus on the advancement, sharing and application of science and technology to sustainable development, peace and poverty reduction through the promotion of equity, access and linkages between scientists and engineers and decision makers. The Workshop was supported by the UNESCO Forum on Higher Education, Research and Knowledge and the department for Research Co-operation of the Swedish International Development Agency (SIDA-SAREC).

Participation

The Workshop was by invitation, with a ceiling of 35 participants to facilitate dialogue and interaction. Thirty-five participants had been identified and invited, and all accepted – indicating a remarkably high level of response and interest in the Workshop. The participants were all internationally recognised specialists in science, technology, innovation and development from around the world – Asia,

Latin America, the USA, Africa, India and Europe (with 20% of the participants coming from Africa), and included the leading innovation scholar – Professor Richard Nelson (US). Prof Alec Boksenberg represented the UK National Commission for UNESCO, and Asa Olsson and AnnaKarin Jonsson Norling represented SIDA-SAREC.

Innovation – a neglected factor in the Development Debate

The Workshop was based on the principle that “innovation offers the only sustainable route out of poverty for developing economies”. Innovation – broadly defined – covers not just new technologies (new to the user or user group), but new services and new forms of managerial organisation. As a general conclusion, the application of new knowledge is perhaps *the* neglected factor in the development debate.

The definition of innovation developed by the workshop is fairly broad: innovation covers not only new technologies in private sector firms, but new forms of organisation for public sector activities that support development. Innovation needs to be supported among women and the rural poor, as much as the emerging and powerful multinational firms that characterise the more successful emerging economies.

Developing Economies – a Heterogeneous Group

The Workshop noted that developing countries have become more heterogeneous over time. Countries such as Brazil, India and China have emerged as powerful economies with firms that help define the frontiers of technology in their chosen sectors. Brazil has pursued resource-based industrialisation. South Korea, China and Taiwan have used different, but successful catch-up policies. Other economies, notably some in Africa, have seen less progress and face competition from rival emerging countries. One focus of debate was how countries might best get on to the ladder of development when large developing economies already occupy the space reserved for low skill, low labour cost products and services.

All sectors innovate

The workshop also found there is considerable variation *within* countries: women’s experience is different to men; there is an urban/rural divide even within the most successful economies; rich and poor co-exist; there are informal as well as formal sectors. Yet all sectors innovate. Rural women in particular stand to gain much from innovation, for instance through the relief of drudgery. The spread of AIDS and other illnesses has focussed debate on labour shortages in rural economies.

Innovation as a Development Issue

The workshop covered a wide range of themes in an authoritative debate. Among key points that emerged from extensive discussion were:

- **Historical context:** Both Dr Tony Marjoram and Geoff Oldham stressed that the role of technology in development had been a long running theme on the development agenda for nearly forty years, with different nuances over time. Yet its importance has always neglected, although there are now slight signs of change. This workshop aimed to bring the role of innovation to the centre of the development agenda
- **Intellectual background:** Professor Stan Metcalfe focussed on “Restless Capitalism”: the paradox of creative destruction behind innovation. Professor Metcalfe also drew attention to the set of rules and institutions that allow change and innovation of all sorts to take place. There was a reminder of the central role of the profit motive in promoting adoption of private sector technologies.
- **Economic issues:** Professor Philippe Laredo, implied there is a “ladder of development” whereby countries progress in line with their factor endowment. As they succeed as innovators and incomes rise, these countries trade more sophisticated products and services and, in turn, make way for newcomers. But how does this succession of development opportunities fit alongside endless labour supplies of China and India? Professor Laredo felt part of the solution is to be found in branding and product differentiation. In this context, “system integrators” play a key role. This focussed debate on the role of multinationals in helping countries innovate.
- **Ethical issues:** Professor Liliana Acero’s analysis of new reproductive technologies raised new ethical issues surrounding innovation in a powerful way: Should regulation be applied in this sensitive area? There are rich/poor issues relating to access to medical procedures and north-south discrepancies too.
- **Sustainability issues:** Professor Fred Steward raised the need for new socio-technical regimes - revolutions in consumption as well as production – that offered sustainable routs to development. Niches of variety in countries such as China may allow new, lower carbon technologies to supplant the old.
- **Resources matter:** Both K.J. Joseph and Professor Metcalfe reminded the workshop that capital is scarce. Yet it is the vehicle that makes things happen. Technical innovation is seldom understood by the development banks that finance projects. Innovation is risky and implies failure. Do financial institutions play safe in their development decisions? Local capabilities also matter, as labour skills are needed both to absorb imported technology and – above all generate local technology. Women are neglected here, yet evidence shows they are innovative and shrewd.
- **Ignorance of the Service Sector:** Innovation is not just about science, not just about technology, but also relates to organisations and institutions. We know nothing about the service sector of developing economies and

how it progresses. This includes the private service sector, informal services and the public services including health and education.

- **“Catch-up” is too simple an idea:** It is clear from a powerful paper by Keun Lee that catch-up has worked, but using different models in Korea, Taiwan and China. This would also have been true for post-war Europe supported by Marshall Aid. But, catch up is not a simple concept. Some economies exceed this target: Firms in developing economies often acquire capabilities that put them on the global frontier of technology. There are strong examples in Brazil, South Korea and Taiwan. So the issue is not just one of simple catch up. Conversely, other economies fail to close the gap in terms of technology and living standards. There is no clear agreement on a range of issues, including the role of universities in the catch up process. Ed Amann pointed to the emergence of sophisticated multinational firms based in developing economies.
- **It is not clear how firms acquire technology:** Gordon Ollivere outlined the role of “intermediaries” in technology transfer with the aid of compelling examples. It is clear that customers and suppliers, such as machinery suppliers, are key sources of advice. What is the best role of technical intermediaries, particularly in fostering “open innovation” collaboration between north and south? How far will firms in emerging economies depend upon “systems integrators”, whether they be multinational companies, leading retailers or “Fairtrade” brands to link in to supplying the differentiated products that advanced economies consume? How does Africa latch on to system integrators if firms increasingly want complete sub-assemblies which require a whole sub-set of local capabilities not found in developing economies?
- **Not just about firms:** Firms are supported by a whole system of markets, publicly provided institutions such as health, water, roads, airports, justice and the legal system and defence. These provide a supporting infrastructure for innovation, including public sector laboratories and universities.
- **The public sector needs to innovate too:** The compelling example of water suggests that the public sector needs to innovate too if it is to meet burgeoning demands. It is not clear whether privatisation and liberalisation encouraged by the World Bank in the 1990’s has helped or hampered innovation. There is a lack of evidence on this issue.
- **What is the role of universities?** There is no clear agreement on the role of universities and public sector laboratories in developing local capabilities. Should they lock in to world science in an attempt to participate in debates at the frontiers of science, or should they research and transfer technology appropriate to local problems? It is clear that local skills and human capital play a key role in the innovation process,

but the absence of a powerful higher education sector precludes local training and encourages a brain drain of talent to advanced economies.

- **What about intellectual property rights?** How has imposition of strong intellectual property rights regime by advanced economies inhibited or helped the transfer of technology to emerging economies? Has imitation and reverse engineering proved a viable way to gain knowledge? How have developing economies coped with the transition to indigenous design? Has it been possible to acquire tacit knowledge? The likely answer is going to differ from industry to industry and context to context.

Developing a research agenda, developing networks, developing training.

Three areas for action emerged from the Workshop:

Developing a research agenda, developing networks, developing training and the exchange of ideas.

- A research agenda is now being developed as part of a post-workshop communiqué. The issues discussed at the workshop represent a formidable research agenda in their own right.
- There is a need to link researchers and policy makers working on technology and development. Some networks exist, but there is scope for bringing cohesion to a disparate set of workers on this topic with a view to making a greater impact on development action. Plans for more coordination are being developed.
- There is a need to raise awareness of the crucial role of innovation among policy makers in developing economies. In particular, the widely differing experience of emerging economies suggests that there is much to be gained by south-south cooperation. The policy community itself is very diverse at global, national and local level.

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