



Innovation, Sustainability, Development: A New

MANIFESTO

STEPS Annual Symposium, 24th September 2009

Innovation, Sustainability, Development: Emerging themes, challenges
and opportunities

Report of discussions and implications for the New Manifesto

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Report of the STEPS Annual Symposium, 24th September 2009

This report puts forward summaries of the sessions at the STEPS annual symposium 2009, especially the implications of these discussions for the shape and content of the new manifesto and for the wider project of which it forms a part. In doing so it also attempts to go at least part of the way towards responding to the challenge put forward by one of the participants who discussed the event on the STEPS Centre blog – The Crossing:

“Perhaps the drafters of the Manifesto should look to their own advice on how to proceed. When faced with the food for thought generated by the symposium it might be pertinent to ask which bits to eat, who says so and why?”

Oliver Johnson, writing on The Crossing

<http://stepscentre-thecrossing.blogspot.com/2009/09/steps-symposium-democratising.html>

The report first covers the presentations each of the sessions below in turn:

- Session 1: Themes, challenges and opportunities – international debates
- Session 2: Grassroots/bottom up innovation: How to facilitate emergence and flourishing
- Session 3: What opportunities are presented by the global redistribution of innovative activity?
- Session 4: Internationalisation of science, technology and innovation policy: What room for “constitutional” reform?
- Responses from the international community, government, media, civil society and the private sector

Although not every point was captured, this report has also tried to cover some of the debates that took place during the question and answer sessions after each set of presentations. Whether contributing presentations or wider discussion, each of the participants put forward points in a personal capacity, rather than necessarily reflecting the official viewpoints of their institutions. The STEPS Centre have taken on many (but not all) of these points to produce an updated draft of the new manifesto which will be circulated to

the hosts of the roundtables that will be taking place over the coming six months. Points made at the symposium, and further comments received through the roundtable events will be discussed within the STEPS Centre as a contribution to the final version of the manifesto, which will emerge in the first half of 2010. More importantly, however, the inputs, discussions and conclusions of these events will be documented on the website <http://anewmanifesto.org>.

Various additional multimedia documentation of the symposium proceedings can all be found on the STEPS and New Manifesto websites:

- Video vox pops: <http://www.youtube.com/user/STEPSCentre>
- Blogs from the Symposium on the STEPS Centre blog, The Crossing
- <http://stepscentre-thecrossing.blogspot.com/search/label/Manifesto>
- Speaker presentations are available to view, share and download from our Slideshare site: <http://www.slideshare.net/Stepscentre/presentations>
- Photos from the Symposium are on our Flickr page: <http://www.flickr.com/photos/23190361@N08/sets/72157622355922249/>
- The Institute of Development Studies' Big Question *podcast focuses on the New Manifesto project and features interviews with Geoff Oldham and Suman Sahai: <http://www.ids.ac.uk/go/news/the-big-question-for-development-ids-podcast-october-2009/>

Session 1: Themes, challenges and opportunities – international debates

This first session, chaired by **Melissa Leach**, introduced and contextualised the new manifesto project, outlining some of the assumptions of mainstream approaches and identifying opportunities and challenges for radical change. Responses provided a historical perspective to the manifesto and outlined some of the aspects that speakers felt were missing from the current draft, or needed further thought.

Speakers (for biographies, see Appendix 2)

Dr Adrian Ely

Slides available at: <http://www.slideshare.net/Stepscentre/manifesto-adrian-ely>

Prof Geoffrey Oldham

Slides available at: <http://www.slideshare.net/Stepscentre/manifesto-geoff-oldham-the-sussex-manifesto-and-its-aftermath-september-2009>

Prof Banji Oyelaran-Oyeyinka

Dr Tony Marjoram

Discussion and Implications for the New Manifesto

The session began with an introduction to the manifesto project, and the primary arguments being put forward within the ‘new manifesto’. Responses highlighted some of the changes that had taken place since 1970 when the original manifesto emerged, and contrasted the content of the new and old manifestos. A recurrent theme was that the simple categories of “developing” or “developed” countries no longer hold, and in considering innovation policy, as with other arenas, a more nuanced and contextually specific approach is needed.

Geoff Oldham highlighted the strengths of the original manifesto – its appreciation of a systems perspective and its recognition of the role that scientific and technological services, as well as pure research and development. He specified that the original manifesto had not focussed so much on distributional issues related to poverty alleviation, gender or the environment. Instead, he said, the new manifesto puts these at the centre of its recommendations. He questioned the appropriateness of a document such as this being produced by a small group of Western academics and expressed a hope that the new manifesto would stimulate thinking and debate, and hopefully lead to the production of other manifestos emerging from different parts of the world.

Banji Oleyaran Oyeyinka reflected back to his time at Sussex 25 years ago, when there were healthy debates (and rivalry) between IDS and SPRU. His research since has, broadly, looked at what causes uneven paths of development, including between and within developing countries themselves. Again referring to the question of categories, he put forward three groups for ease of analysis – frontier countries, first followers and late followers, but also highlighted that important inequalities occur within national borders down to the level of households. Banji highlighted the neglect of innovation in mainstream initiatives, and in particular, within the MDGs, which have prioritised outcomes at the expense of the efforts and associated learning and knowledge creation vital to the innovation process. Eradicating poverty will be very difficult without taking these concerns more

seriously. In addition, although the MDGs have recognised individual human capital, for example through health, primary and secondary enrolment, the 'capacity to create', and the systemic capabilities – including those within organisations and institutions that are shown to be important when analysing innovation in firms or clusters - are absent from these documents. He argued that the manifesto should highlight these points, and emphasise the ways in which they help to build up the productive sector and create a broader cross-section of enterprises. Banji went on to discuss aid, debt-relief and trade, currently not explicitly addressed in the draft manifesto. Highlighting the fact that many developing economies have for decades remained focussed on natural resources, Banji argued that claims that developing countries can export their way out of poverty are misplaced, and indigenous innovation capacity needs to be a central objective. In moving forward, he argued that we must be very mindful of the negative role of inequality, avoid romanticising informalities and the manifestations of poverty and focus on eradicating them, as well as building the productive sectors.

Tony Marjoram highlighted several of the arguments in the original manifesto that are relevant today, and pointed to the 1970s as a golden decade for development, with initiatives around appropriate technology and other lessons that are usefully being revisited within the manifesto project. The structural adjustment of the 1980s led to a decline in many of these initiatives, however UNESCO continued to try to foster collaboration and co-ordination through meetings such as CASTAfrica I and II and CASTAsia I and II, and in some cases the recommendations were taken up. Through the 1990s to the MDGs, the importance of innovation remained under-emphasised however began to be recognised again into the 2000s. Tony questioned whether there are indeed any “mainstream models for science and technology for development” that the new manifesto hopes to challenge, and pointed to many initiatives outside the infrastructure/R&D investment models. He also pointed to climate change debates that focus on adaptation, mitigation, technology and finance, stressing that innovation's importance is still underplayed in current documents such as “Acting on climate change: The UN system delivering as one”, and arguing that climate change presents an important opportunity to kickstart more interest in innovation among policymakers through the provision of information, data, indicators and of course advocacy and lobbying.

Important points were raised by the audience – with Martin Bell asking whether we were talking to ‘the enemy’ (who saw innovation as solely the preserve of the most developed countries) and Brian Wynne arguing that we can potentially open up room for ‘Southern’ institutions to act more freely by focussing our recommendations at ‘Northern’ institutions. Raphie Kaplinsky put forward a presentational point, arguing that the first Sussex Manifesto was in many ways a precursor to endogenous growth theory, and suggesting that the new manifesto should be described as asking what is the content of that endogenisation of science and technology. He also questioned whether there would be widescale acceptance of what he saw as the manifesto's implicit emphasis on the precautionary principle, and downplaying of growth as an objective. Whilst a key challenge for global sustainability is for the north to stop “growth”, there are certain parts of the world where growth is vital.

Banji's earlier points were to some extent reiterated by Ponge Awuor who asked whether, with the likely failure to achieve the MDG targets, there was a danger that goalposts would shift and, as there was no bottom-up element in the implementation of the targets, there were severe limits to the long-term sustainability of the initiatives to reach these targets. Indigenous knowledge was also comparatively neglected in the Millennium project.

It is clear that, whilst focussing on the role of innovation in poverty alleviation and environmental sustainability, the current draft of the manifesto does not explicitly address other development issues raised by some of the speakers - of trade, finance/debt-relief, aid, unemployment. It was suggested that these must either be brought in to the analysis or,

more realistically, acknowledged for their importance before proceeding to the key focus of the document. The STEPS Centre was also urged to engage with debates around the millennium development goals, highlighting the under-emphasis of innovation, innovation capabilities and indigenous knowledge in the efforts to meet them.

Session 2: Grassroots/bottom up innovation: How to facilitate emergence and flourishing

The second session, chaired by **Ian Scoones** took forward one of the focal points of the new manifesto, that innovation is already occurring across the world in forms that are not necessarily picked up by conventional metrics or policies. Such 'grassroots' innovation can cater for needs that remain invisible to large private or public sector actors, and complement local practices and knowledge rather than displacing them. Bottom-up initiatives may drive innovation in directions that serve environmental goals within niches that may eventually displace less sustainable socio-technical regimes. At the same time there is an urgent need to find ways to identify and exploit complementarities between these models and more formal, capital-intensive approaches. This session asked if, and how grassroots innovation and formal R&D-based initiatives can be arranged to work together. How can bottom-up initiatives be promoted without stifling innovativeness and creativity? And should bottom-up innovation be steered in certain (environmentally sustainable) directions, and if so, how?

Speakers (for biographies, see Appendix 2)

Prof Anil K Gupta

Slides at: <http://www.slideshare.net/Stepscentre/manifesto>

Monique Salomon

Slides at: <http://www.slideshare.net/Stepscentre/manifesto-monique-salomon>

Hiroyuki Kubota

Slides at: <http://www.slideshare.net/Stepscentre/manifesto-hiroyuki-kubota>

Dr Adrian Smith

Slides at: <http://www.slideshare.net/Stepscentre/manifesto-adrian-smith-grassrootsbottom-up-innovation>

Discussion and Implications for the New Manifesto

Anil Gupta started the session by putting forward a challenge to the STEPS Centre. In order for the new manifesto to be received more widely throughout the world it would be worth remembering not only Western literature and history in science and technology policy but also that from elsewhere, for example from Indian writers like KM Munshi. He also introduced an important ethical component to the day – arguing that those using knowledge which is given freely in their work should not get paid themselves and stressing the importance of crediting those whose knowledge is given. He argued that the Honeybee model works on the basis of ethics and faith... not on the basis of expensive consultancies, technical complexities or specifications. In addition he argued that even today most ethnobotanical studies do not give the names of those whose knowledge is being reported.

Anil pointed to the importance of grassroots innovation as performed by roadside vendors (still outlawed in South Africa), informal mechanical outfits and the "low-quality" innovators – known in China as 'shanzhai'. The work of these individuals is vital to continuing development in their countries and serves as a lesson to the West, where current design approaches could become much more sustainable through pro-active planning for re-use and repair rather than replacement. Anil suggested that the skills and knowledge, as well as

manpower, of these local innovators need to be recognised through an approach which might be termed 'labour first' (as opposed to 'farmer first').

As well as promoting knowledge sharing at the grassroots using local languages and media, Anil argued that G to G (grassroots to global) transfer of local knowledge is already happening. In some cases, improved (environmental) standards are necessary to enable certain innovations to flourish and to create a market. In others, there is a need for micro venture capital and new financial mechanisms to facilitate the move from informal innovator to entrepreneur.

The message for the new manifesto, and its target audiences, was simple: The message for the UN is simply that they need to open their minds somewhat... and everything else will follow. Compassion, creativity and collaboration are the watchwords we need to access and utilise this grassroots knowledge. The new manifesto needs to have fewer pages, but be "a bold declaration on what restructuring of mind and thoughts we wish to have".

Monique Salomon brought a story of experiences and challenges from Prolinnova - "Promoting local innovation and ecologically-oriented agriculture and natural resource management", an international multi-stakeholder network formed in 1999 that tries to link 'islands of success'. They focus not only of farmer-led innovations in terms of hardware (techniques) but also in terms of the software, for example through different kinds of social organisation supporting marketing and other reforms to mainstream and institutionalise participatory approaches that have been around since the 1970s.

Prolinnova promote farmer-farmer sharing and learning (through the oldest forms of learning) and also link different stakeholders in the chain - farmers, universities and R&D, civil society -formal and informal science (with users/farmers taking the lead) through publications and multimedia, as well as collaborative experimentation – forming a community of theory and practice. Participatory innovation and development training is facilitating attitudinal and behavioural change. A shift among researchers and extension staff is noticeable and important, but at the same time government and policy environments still often militate against grassroots and bottom-up innovation and a fundamental shift is still required.

Hiroyuki Kubota asked the question why, if technology originally has no borders, agricultural technologies can be seen to have had dramatically different impacts in different parts of the world. Hiroyuki compared the productivity increases seen in Asia with those seen in Africa and pointed to some of the reasons and challenges faced by practitioners in government aid agencies like himself. He argued that knowledge and skills are only accumulated in individuals – not in documents, not in institutions or organisations. Japan has had problems identifying individuals - good counterparts and practical partners – in some parts of Africa. Many of the best partners, they find, are near the age of retirement. Some of the universities deliver good graduates but these do not have opportunities for field experience in designing and executing high quality field experimentation and research. As a result "it is quite difficult to invest tax payers' money into African soil for the agriculture sector simply based on data or statistics produced locally." Hiroyuki stressed that investment in this individual human capacity should be an issue to be highlighted in the new manifesto.

Turning to his area of expertise (agriculture), Hiroyuki argued that the green revolution itself may not have benefited all producers, but in many areas at least benefited the urban poor. At a very over-simplified continental level (which was illustrated with figures on increases in rice yield), Africa benefited much less than Asia. Pointing towards the comparative abundance of investment in Asia as opposed to the much lower investment (but much higher ODA) in over the past 3 decades in Africa, he asked if a green revolution of the same kind was possible on the African continent. A new (and, Hiroyuki argued, inevitable)

phenomenon, the African land-grab, represents a new wave of investment into the continent, however land tenure systems are still not properly formed, raising significant risks. He raised the question whether the land-grab also potentially represents an opportunity. How can we (including in the new manifesto) utilise it for sustainable agricultural development in Africa?

Adrian Smith pulled together some of the examples from the previous presentations drawing on work that he has been doing on innovative green niches, especially linking the ideas and initiatives from the South with some of the alternative technology movement of the 1970s. He described a recent visit to South America where he had spoken both with grassroots innovators and also academics studying these processes. He asked whether the presence of grassroots innovation is just a symptom of failure of mainstream innovation systems. Science and technology studies can help to uncover the reasons behind this, as well as the ways to support grassroots innovation. In addition, innovation studies can help us to understand why certain systems are locked in to providing certain services. While this has been shown in depth in Northern settings (e.g. in terms of fossil fuel lock-in), there are contributions that can be made in the South. Putting forward the multi-level perspective introduced by Geels et al, Adrian pointed to his own interest in how to facilitate knowledge sharing between innovative green niches and dominant socio-technical regimes, suggesting that this might be a useful way to bring about more sustainable pathways.

Contributions from the floor responded to the speakers and also put forward opinions on the current manifesto draft. Sheila Jasanoff pointed to the radical disconnect between the US policy approach of sending science diplomats to the Middle East and the kinds of knowledge and innovation being presented in the session. Richard Jolly agreed, and pointed to Adrian Smith's last slide (illustrating multi-level transitions), arguing that this kind of dynamic understanding, especially the role of such dominant imaginaries in preventing alternative forms of innovation from flourishing, was missing from the current draft of the manifesto and should be brought in, possibly using a diagram.

Gerry Bloom suggested that the presentations illustrate how innovation is happening all the time. Most innovation is happening at the grassroots. At the same time, not all innovations are good – in the health field, counterfeit (and sometimes dangerous) drugs are now commonplace in some parts of the world. Gerry suggested more emphasis on the regulation of innovation, but instead of criminalising in order to deliver protection against unsafe products, proposed a more positive approach focussing on social benefits.

Andrew Barnett highlighted the growing use of the term 'innovation' among international bodies like IFAD, and urged that the manifesto be clear about what is meant by "innovation". In addition, he suggested that the draft built further on the political economy aspects of 'empowering the demand side' but put it in a simple way. Although covered in the draft new manifesto, it is not clear in the summary at the beginning – but it is vital that the control is put in the hands of the demand side, not necessarily those who focus on science and technology - scientists/ R&D/ private sector in the North. Lastly, the manifesto needs to be clearer in its message about what it wants DfID and the CGIAR to do differently. Utilising the innovation systems model as a framing diagnostic – including extension, intermediaries, risk-reducing VC, leverage – may be useful in this regard.

Geoff Oldham looked back to an IDRC programme that he had been involved in "modern-traditional technology project" and pointed to the challenge of developing indicators illustrating that these kinds of projects have been an effective use of public money.

Andrew Adwerah asked how to avoid grassroots innovation initiatives being captured by factions in national government systems. Ponge Awuor pointed to the need for a boost in agricultural investment in Africa but also presented a challenge: if the developed world is

dumping obsolete technology in Africa, how is this aiding development? Engineers are being taught how to repair machines from the North rather than creating their own. How does this encourage innovation?

Hiroyuki Kubota responded that most development projects have been unable to unlock the value of traditional practice – through incremental improvement or combining with external technology - in many contexts. Technical experts from the North are not only passing on technology but also learning to improve themselves.

Monique Salomon responded that it was true that not all innovations are good. Innovations need to support “triple bottom line” outcomes, but political economy considerations are also important - powerful interests (e.g. in agriculture) are pushing against grassroots innovation, and this was one of the reasons to form an international network. In response to Geoff Oldham, she claimed that it was nowadays not the donors that they were struggling with, but the host governments – Ministries of Agriculture or of Science and Technology – who say “my extension worker is wasting their time”. To address this challenge, local innovation projects need to innovate as well in order to build outcomes that are recognised by policy-makers and scientists themselves (e.g. scientific papers) as well as those that are useful in the field (eg. farmer fairs),

Anil Gupta responded to Sheila by asking why the stimulus package continued to be channelled through elite institutions. He had previously argued that if just 10% of the stimulus fund could be invested in open innovation (not necessarily open source) it would bring about significant change across the world. The traditional non-inclusive model of growth instead creates marginalised communities that become potential terrorist recruits or criminals. The honey bee model is as relevant in the USA and UK as in India.

In regards to the negative sides of innovation, he pointed to dynamite fishing and other cases. There is nothing innately good about innovation. Noble human values are the only things that drive innovation towards positive rather than negative goals, and he argued that by and large grassroots innovations are more ethical, more green and more sustainable – these are by and large the values that we see at that level.

Adrian Smith concluded that there was indeed no shortage of ferment or ingenuity in the grassroots but that the political context needed to be put back into our understanding of transitions, including the diagram.

Session 3: What opportunities are presented by the global redistribution of innovative activity?

This session was chaired by **Martin Bell** and discussed the opportunities and challenges resulting from the emergence of new centres of science and innovation. Drawing initially on the Demos “Atlas of Ideas” project, and the international activities of the Royal Society, the session debated differing perspectives on the global “redistribution” of innovation, looking at how the increase in certain types of innovation in China, India and Latin America have contributed to poverty alleviation and environmental sustainability, and how governments can manage the changing dynamics of competition and collaboration, and work together to facilitate innovation that serves environmental, social and economic goals.

Speakers (for biographies, see Appendix 2)

Dr James Wilsdon

Prof Xiulan Zhang

Slides at: <http://www.slideshare.net/Stepscentre/maniefsto-xiulan-zhang>

Dr Suman Sahai

Slides at: <http://www.slideshare.net/Stepscentre/manifesto-suman-sahai>

Dr Anabel Marin

Slides at: <http://www.slideshare.net/Stepscentre/maniefsto-annabel-marin-innovation-in-natural-resource-based-industries-in-latin1>

Discussion and Implications for the New Manifesto

Drawing on several years of work on the ‘Atlas of Ideas’ project, which engaged with similar issues to those already discussed during the day - hidden vs visible innovation, national vs cosmopolitan as well as issues of scale vs. direction - **James Wilsdon** pointed again to shifting geographies of innovation, most recently exemplified by the launch of the King Abdullah Science and Technology University in Saudi Arabia. These raise questions not only about competitiveness and the international flow of skilled scientific labour, but also about the governance of science, technology and innovation trajectories. The entry of so many new players makes international decision-making in the area of emerging technologies less predictable and more plural, and raises challenges and opportunities for the kinds of governance changes on which the manifesto project focuses. Turning to recent work in the Royal Society, James introduced the area of geo-engineering and argued that as a result of such international dynamics it was important to expand the circle of discussion outside traditional bases. Broad international collaboration will be vital to avoid any potential harm that might result from unilateral action or even a ‘green finger’ scenario (that describes individual entrepreneurs taking the initiative with large-scale engineering of the climate). Renewed interest in science diplomacy in the US and UK is an exciting area in which such collaboration is being taken more seriously. Turning to the manifesto draft, James raised the vital challenge of bringing its messages into the heart of science policy in government, rather than just the margins. The Royal Society’s inquiry into the “Fruits of Curiosity: science, innovation and future sources of wealth” will report in March 2010, during the society’s 650th anniversary year. How can the emerging agenda highlighted in the new manifesto link up with these debates as we move towards a new government (in the UK) and a new set of economic and environmental challenges internationally?

Xiulan Zhang delivered a presentation reflecting on innovation, sustainability and development based on recent developments in China (at the time celebrating 60 years of the People's Republic, and recently 30 years since reform and opening up). Highlighting the rapid changes that are going on in China's society at present, she emphasised the high speed, high risk era that the country was witnessing. The risk *from* development, as well as the risks *to* development, are thus now becoming a priority. The challenge in her opinion was to build resilient development – including institutions and infrastructure that can maintain high growth but at the same time social cohesion and environmental sustainability. These had been tested not only in the 1997 Asian financial crisis but also more recently when huge numbers of workers returned from the coastal areas as a result of the economic downturn, many to start rural enterprises that employed millions of people. Building on the growing rural economies, social insurance, education and healthcare investments were increasingly being deployed as part of the new welfare state agenda. At the same time, the government is investing in rural infrastructures and diversified human resources for indigenous innovation.

Suman Sahai talked about alternative forms of innovation (rather than R&D-focussed approaches) in India, highlighting that there remain under-recognised initiatives that could contribute substantially to poverty alleviation and environmental sustainability challenges. Such informal innovation responds to people's problems, rather than those concentrating on economic growth. As an example, she pointed to the Indian National Knowledge Commission, the content of which focuses on mining, energy, automobiles, banking systems etc. In the agriculture field, the focus is on biotechnology. Suman's argument is that other forms of innovation are absent, and that all of us, in our national contexts, need to accord value and social prestige to informal innovation, which has been stripped of aspirational value.

Anabel Marin's presentation focussed on interlinked innovations in the agricultural sector in Latin America as a case study of how wider innovation benefits can develop from an economic focus on natural resource endowments (still common in many African and Latin American economies). Highlighting especially the productivity impact of zero tillage technology (which relied on agrochemicals, transgenic seeds and also social innovations including the emergence of professional contractors), she also pointed to more questionable effects, e.g. both creation and destruction of employment. In addition, she highlighted the risks from the current trajectory – to the environment, to the ability of Argentina (currently relying heavily on imported knowledge around transgenic seeds) to produce its own innovations and to poverty reduction (currently little-affected) - and pointed to the choices available to the Argentinean government about which technological pathways to support. She especially highlighted the intense costs of such support, and, given conflicting interests, asked if both GM and non-GM trajectories were possible.

In the **question and answer session**, comments were made about the cost of supporting certain forms of innovation. Referring to Anabel's presentation and the previous example of KAUST, it was questioned whether this represented the original manifesto's concept of "scientific conspicuous consumption". Rather than focussing on a supply mentality, it was important to concentrate on more effective innovation (in terms of outcomes). For better or for worse, this will usually emerge from empowering those markets that are currently neglected due to poverty and inequality. Xiulan added that state demand (in order to maintain competitiveness) and consumer demand (articulating people's needs) worked together. Especially in the case of shanzhai innovation, the market plays a key role.

Raphael Kaplinsky put forward the suggestion that rapidly growing markets in China and India represented "second bottom billion"/ "a near bottom of the pyramid", and argued that the Manifesto ought to recognise that more, moving from what he characterised as a

Schumacherian perspective towards a Schumpeterian perspective. Fred Steward argued that there seemed to be a shift in Chinese policy on climate change... representing a broader shared agenda between the 'developed' and 'developing' world, alongside an extraordinary diversity of innovations being highlighted. Neither Schumpeterian nor Schumacherian models of innovation are adequate in this context. The new manifesto has to try to articulate an appropriate model, conceptualising a new thinking about diversity in innovation.

Anabel Marin's presentation had put forward a choice about technological pathways and the kinds of policies that might support them. Andrew Barnett added that there was a presumption in the draft manifesto document that governments were able to implement these policies, whereas in reality the ability of the state to mediate these hugely difficult conflicting interests effectively is an important consideration, and various other actors play a significant role.

Session 4: Internationalisation of science, technology and innovation policy: What room for “constitutional” reform?

In response to the set of proposals put forward in the New Manifesto (outlined by Andy Stirling), this session, chaired by **Adrian Ely**, discussed the potential for reform of institutions involved in setting STI policy (including governmental and non-governmental actors at national and international levels). A particular focus was approaches that might catalyse increased democratic accountability to the stated beneficiaries of innovation policies.

Speakers (for biographies, see Appendix 2)

Professor Andy Stirling

<http://www.slideshare.net/Stepscentre/manifesto-andy-stirling>

Dr Des Turner MP

Professor Sir Richard Jolly

Professor Brian Wynne

Slides available at: <http://www.slideshare.net/Stepscentre/manifesto-brian-wynne>

Discussion and Implications for the New Manifesto

Andy Stirling tried to address some of the points that had been flagged up earlier in the day, especially about choice over trajectories, about the role of markets and demand, and the role of government, in doing so clarifying the STEPS Centre’s aim - to help catalyse a vigorous, reflexive democratic politics of innovation. He put forward a characterisation of how high level policy discourse engages with innovation – one that dismisses choice between technologies and assumes a unitary notion of progress measured by linear metrics of rate and scale. Andy then put forward an alternative view, focussing on different directions of innovation which delivered more or less equitably distributed and diverse outcomes. Running through some of the recommendations in the draft manifesto, he outlined the national and international reforms that might help to democratise innovation.

In response, **Des Turner** generally accepted most of the recommendations, but was clear that the draft manifesto needed shortening and simplifying before it would be taken up by most politicians. He stressed that social innovations allowing development and deployment were the challenge, rather than necessarily the “science and technology”, and that these were extremely difficult. He did, however, point to some successes, for example the use of advance market commitments in providing the incentive for orphan drug development. In addition, Des highlighted problems of capacity and corruption in reporting to national parliaments on public R&D and innovation activities, suggesting that development agencies and NGOs need to redouble their efforts at building indigenous capacity. He agreed with requirements for reporting by private firms, especially in terms of financing R&D and deployment, and the idea of strategic innovation forums (bearing in mind the concerns above). He highlighted that intellectual property regimes were already changing at international level, and also endorsed the idea of a global innovation commission, adding however that it should be regionalised.

Richard Jolly highlighted the shifts that had occurred since Hans Singer and his colleagues produced the original Sussex Manifesto – not only in terms of science and technology, but

also through the rise of the Asian economies and moves towards a multi-polar world. Within this context, he argued that countervailing actions were necessary to offset pressures acting upon innovation from organisations such as the TRIPS regime. With respect to demand issues, he highlighted the overwhelming impact of the USA's 14 trillion dollar economy, and its pull on innovation resources (including backwash effects that might be limiting action in the South). He suggested that the new manifesto could draw on experiences with gender-responsive budgeting or children's budgeting in order to address biases in inequitable allocations between groups. On the recommendation for a global commission, he pointed out that there have been several global commissions (with various effectiveness) but that the modality for choosing members would need to be a key concern. His suggestion would be to focus on distinction – intellectual and analytical, rather than representation of the powers that be. It would also be important to see how the national strategic innovation forums could feed into the global monitoring.

Brian Wynne highlighted that policy makers usually assumed that institutional frameworks were static and fixed, and thus demanded new methods. This raises challenges and opportunities for the new manifesto's recommendations. Brian identified 'rich world' institutions as the problem in much of the 'poor world' and suggested that attention needed to be focussed on those in order to enable space and room to manoeuvre for the poor world. He focussed on a key sector – food – and used the example of the GMO controversy in the UK to demonstrate how scientists actually re-oriented their imaginations somewhat after the BBSRC 1994 consensus conference, and the subsequent years which saw spontaneous forms of public mobilisation, opposition and controversy. This provided an example of how different forms of public engagement had led to changes in science and technology, as illustrated by the BBSRC's 2004 crop science review.

In the discussion, Roger Williamson highlighted the role of advance-market commitments for low-carbon technologies as well as in the pharmaceutical arena. He also pointed to the Kigali Institute for Science and Technology – an indigenous initiative that might serve as a model for positive replication. Richard Jolly followed this by suggesting that money and finance had generally been underemphasised in the discussion. No country will enact anything unless they have a budget.

Sheila Jasanoff suggested that implicit in the recommendations was the ghost of the Bretton Woods settlement - an international order constituted through national orders. She asked whether, in the face of demands on innovation being set by the needs of a \$14 trillion economy, it was necessary to make room in the manifesto's imagination for a really radical constitutional reconfiguration. Fred Steward pointed to the fact the dynamics within new institutions, not the institutions themselves, is what counts. Andy Stirling agreed, reiterating that these recommendations really represented an attempt at "constitutional judo" that would create room for more progressive dynamics.

Ehsan Masood raised argued that the Commissions that tend to work better are those where there is an established demand from policy makers, asking whether IPCC was actually a good example. Less successful was the millennium ecosystem assessment, with the IAASTD possibly being the least effective. With respect to the recommendations on private investment, he argued that regulatory change in the financial sector was a good example of where commercial firms have been regulated anew.

Responses from the international community, government, media, civil society and the private sector

The last session, chaired by **Melissa Leach**, invited various participants to feed back on the preceding discussions.

Speakers (for biographies, see Appendix 2)

David Dickson

Dr David Grimshaw

Joachim Voss

Christine Drury

Slides available at: <http://www.slideshare.net/Stepscentre/manifesto-private-sector-reflections>

Discussion

Pointing to initiatives such as the British Society for Social Responsibility in Science (several of the founder members of which were in the room), and a range of controversies from Silent Spring to the Vietnam War, **David Dickson** challenged the assertion (in the draft manifesto) that the 1960s was a time of techno-optimism. The mid-late sixties, he said, was already a time when people were realising that science and technology was political, and since then various strands of work, including SciDev.Net have emerged that have tried to enable and stimulate more debate. The challenge for the manifesto project is to recognise these different activities and reflect and support them in its recommendations. It is necessary to build capacity throughout innovation systems to discuss and challenge the existing politics of technology, and journalists are particularly important here. Change will not come from new institutions or just from taking better decisions, but through challenging the power lying within existing institutions – this is already happening in many of the debates around innovation systems throughout the world.

David Grimshaw challenged the manifesto to include 3 Vs – more on vision, more on values, and more on validation. Both IDS/SPRU and ITDG (now Practical Action) have 40 years of intellectual heritage, but we need to keep updating ourselves. Firstly, David suggested we start with visions and dreams – what is the manifesto's one-line vision that gets the message across to the public? Secondly, having taught in business school about targets and managerialist approaches he can recognise that the MDGs may have taken the world in the wrong direction. Economic growth is not delivering happiness, so it is important to base the manifesto's message on a set of ethical, philosophical and explicit values. In addition, he pointed to validation and process thinking, and challenged the manifesto project to use more modern, high-tech methods e.g. open source, open collaborative methods in order to get validation of the manifesto outputs.

Joachim Voss suggested that more attention needs to be paid in the manifesto to the rapid rise of inequality, including to the new philanthropists and how they influence the innovation agenda. At the same time, he suggested a more nuanced view as to the role of the state, highlighting that in many cases it has been those governments that have made large investments in education and human capital development have become the most successful in terms of building innovative and dynamic societies. Pointing to the increasing levels of

donor aid (and decreasing private investment) in Africa, he highlighted the lack of accountability of donors to their supposed beneficiaries as a challenge to the manifesto.

Christine Drury pointed to the challenges facing the private sector at present: both in terms of resilience (in terms of economic sustainability and strength against take-overs) but also concerns over corporate social responsibility, safety policy and practice, company missions, identity, knowledge and brand strength. Climate change is currently driving a huge amount of this change (e.g. carbon disclosure requirements), but these pressures are also crowding out many of the other sustainability objectives and agendas. The manifesto should turn this to an opportunity and focus more on the regulatory context in which firms act. In addition, it should be aware of the time that it takes corporations to move from product quality to organisational excellence – the public policy frameworks facilitating this shift therefore need to be consistent and predictable. Christine suggested that the manifesto's target audiences should include the corporate strategy gurus. She argued that corporate social responsibility was becoming more visible, and brand's "social missions" were becoming more central in corporate practice. The world is therefore less polarised than the manifesto currently suggests – and partnerships present exciting opportunities for the future.

Melissa Leach responded by thanking each of the speakers, and reiterating that the manifesto draft, and the day's discussions were part of a process involving the symposium participants and many other organisations. STEPS is not arguing that this particular Sussex group is unique or the only people putting forward these arguments, but rather part of a growing groundswell of opinion and discussion. Part of that process is trying to involve more information technology tools, including the wiki timeline, multimedia manifesto and roundtables, as far as our expertise and resources allow.

Appendix 1: List of Participants

Andrew Adwera	African Centre for Technology Studies, Kenya http://www.youtube.com/watch?v=Z7bjNUWCT5Y&NR=1
Jeremy Allouche	Institute of Development Studies
Elisa Arond	STEPS Centre
Ponge Awuor	Institute of Dev. Studies Nairobi, Kenya http://www.youtube.com/watch?v=V2OCXWLxEFk&NR=1
Andrew Barnett	The Policy Practice http://www.youtube.com/user/STEPSCentre#p/u/21/SLjHUO9VIqY
Martin Bell	SPRU, The Freeman Centre
Gerry Bloom	STEPS Centre
Sally Brooks	STEPS Centre
Rob Byrne	SPRU, Sussex University
David Dickson	Sci-Dev Net
Christine Drury	Independent Consultant
Sarah Dry	STEPS Centre
Adrian Ely	STEPS Centre
Maria Eugenia Fazio	REDES, Argentina http://www.youtube.com/user/STEPSCentre#p/u/9/-ZeZl4jLmbU http://www.youtube.com/user/STEPSCentre#p/u/10/4LwKSZkV3DE
David Grimshaw	Practical Action/ DfID http://www.youtube.com/user/STEPSCentre#p/u/17/1jL1CN0Z8W0
Anil Gupta	Indian Institute of Management http://www.youtube.com/user/STEPSCentre#p/u/20/Zbcvxik-eXU
Emily Hamblin	UK Government Office of Science
Sheila Jasanoff	Harvard Kennedy School http://www.youtube.com/user/STEPSCentre#p/u/3/Wchh88BFE70
Ollie Johnson	SPRU, Sussex University
Richard Jolly	Institute of Dev Studies http://www.youtube.com/user/STEPSCentre#p/u/5/bbAytREaTzY
Raphie Kaplinsky	Open University http://www.youtube.com/user/STEPSCentre#p/u/6/RRapPWBZgsU
Tim Karpouzoglou	STEPS Centre
Hiroyuki Kubota	Japan International Cooperation Agency (JICA) http://www.youtube.com/user/STEPSCentre#p/u/14/vwZoQ2oEiBE
Melissa Leach	STEPS Centre
Hayley MacGregor	STEPS Centre
Annabel Marin	SPRU, Sussex University
Tony Marjoram	UNESCO http://www.youtube.com/user/STEPSCentre#p/u/1/5Nfro4mihvE
Fiona Marshall	STEPS Centre
Ehsan Masood	Freelance journalist
Erik Millstone	STEPS Centre
Liz Nganga	Open University
Julius Mugwagwa	Open University http://www.youtube.com/watch?v=j3s3D9EQYro&feature=related
Geoff Oldham	Co-author original Sussex Manifesto
Ilse Oosterlaken	Delft University of Technology, The Netherlands http://www.youtube.com/user/STEPSCentre#p/u/13/Mmyspu8nlcA
Banji Oyelaran-Oyeyinka	UNHABITAT http://www.youtube.com/user/STEPSCentre#p/u/19/dl5Uj_ANI2g
Harley Pope	STEPS Centre

Pritpal Randhawa Suman Sahai	STEPS Centre Gene Campaign, India http://www.youtube.com/user/STEPSCentre#p/u/2/nznBNEiNZbQ
Monique Saloman	Prolinnova South Africa http://www.youtube.com/user/STEPSCentre#p/u/8/O0iKr34fMTM
Ian Scoones Awadhendra Sharan	STEPS Centre SARAI, India http://www.youtube.com/user/STEPSCentre#p/u/15/2S2hzad9gXA
Adrian Smith Fred Steward Andy Stirling John Thompson Des Turner MP	STEPS Centre Brunel University STEPS Centre STEPS Centre MP for Brighton Kempdown http://www.youtube.com/watch?v=10KInFVEAAQ
Paddy Van Zwanenberg Joachim Voss	STEPS Centre Independent Consultant in International Development http://www.youtube.com/user/STEPSCentre#p/u/12/l3ogvuy_G6w
Linda Waldman Anna Walnycki Watu Wamae	STEPS Centre STEPS Centre Open University http://www.youtube.com/watch?v=-gLg-cfLYs&feature=related
Katharina Welle Annie Wilkinson Roger Williamson	STEPS Centre STEPS Centre Wilton Park http://www.youtube.com/user/STEPSCentre#p/u/4/LemsK39BBME
James Wilsdon Brian Wynne Xiulan Zhang	The Royal Society University of Lancaster Beijing Normal University http://www.youtube.com/watch?v=WIO7FGn-J-M

Appendix 2: Speaker biographies

Session 1: Themes, challenges and opportunities – international debates

Dr Adrian Ely

Adrian Ely is a research fellow at SPRU –Science and Technology Policy Research at the University of Sussex and a member of the STEPS Centre. His research experience has primarily focussed in the area of biosafety and biotechnology policy in Europe, the USA, China and to a lesser extent East Africa. More broadly, he is interested in the contribution of innovation to sustainability. He is convening the project “Innovation, Sustainability, Development: A New Manifesto”.

Prof Geoffrey Oldham

Geoffrey Oldham’s early career took him from the Standard Oil Company and the Scientific Directorate of OECD to Sussex, where he helped start SPRU in 1966, later acting as director from 1980 to 1992. In 1970 he was one of the authors of the original «Sussex Manifesto». He was also instrumental in the establishment of the International Development Research Centre, later directing its Science and Technology Policy Programme for ten years and serving as Science Adviser to the President of IDRC from 1992 to 1996. In recent years he contributed to the design of the Science and Development Network (www.Scidev.net) and previously chaired the network's Board of Trustees. Geoffrey Oldham has served on numerous science and technology policy advisory bodies, most recently the UN Commission on Science and Technology for Development, where he chaired the working groups on Gender and Science and Technology, and on Information Technologies and Development. He is an Honorary Professor with SPRU at the University of Sussex.

Prof Banji Oyelaran-Oyeyinka

Until recently, Banji Oyeyinka was a professor of Technology, Innovation and Development and a senior researcher with the UNU/INTECH, now UNU/MERIT. Prior to his INTECH appointment, he served as a Senior Economic Officer with the UNCTAD, Geneva, and coordinated the UN Special Panel on the Review of the UN Programme of Action for the Least Developed Countries (LDCs) in the period 1990-2000. Before then he was a professor of Technology Management at the Nigerian Institute of Social and Economic Research (NISER), Ibadan, Nigeria. At the national level he was involved in the review of Nigeria’s Industrial Policy and coordinated the Industry, Science, and Technology Committees that drew up the country’s Vision 2010 document and served as the National Focal Point of the African Technology Policy Studies (ATPS) Network. He has served as consultant to UNIDO, UNCTAD, ILO, and ECA and authored several journal articles and books, including "Uneven Paths of Development: Innovation and Learning in Asia and Africa" with Rajah Rasiah (Edward Elgar, 2009), and "Latecomer Development: States, Innovation and Knowledge in Economic Growth" with Padmashree Gehl Sampath (Routledge, 2009).

Dr Tony Marjoram

Tony Marjoram is the Senior Programme Specialist responsible for Engineering Sciences and Technology in the Division of Basic and Engineering Sciences of the Natural Sciences Sector of UNESCO. Dr Marjoram has worked for UNESCO since 1993, and has over 25 years experience in international policy, planning and management in engineering, science and technology for development in university, intergovernmental and NGO contexts. He was the Senior Research Fellow in Development Technologies at the University of Melbourne from 1987-93 and a Development Fellow at the Centre for Applied Studies in Development and then Director of Technology at the Institute for Rural Development at the University of the South Pacific from 1980-87. Dr Marjoram created, developed and manages the Daimler-UNESCO Mondialogo Engineering Award and was a member of the UN Millennium Project

Task Force on Science, Technology and Innovation. He has published books and over 50 papers, articles and reports in national and international journals, and is on the editorial boards of several journals.

Session 2: Grassroots/bottom up innovation: How to facilitate emergence and flourishing

Prof Anil K Gupta

Anil K Gupta holds the Kasturbhai Lalbhai Chair in Entrepreneurship at the Indian Institute of Management. His interests include supporting grassroots innovators, blending 'formal' and 'informal' science, and creating knowledge networks. He is President of the Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI), and executive vice chair of India's National Innovation Foundation. He is also Founder of the HoneyBee Network.

Monique Salomon

Monique Salomon is a researcher with the Centre for Environment, Agriculture and Development (CEAD) at the University of KwaZulu-Natal. She was the original initiator and coordinator of the Prolinnova-South Africa Country Programme (CP) and an elected CP member of the first Prolinnova Oversight Group (POG), during the time when she was Director of the NGO called Farmer Support Group. She then decided to focus on her doctoral studies, which deal with innovation, participation and natural resource management (NRM), specifically by livestock-keepers. She is co-author of the book on RAAKS (Rapid Assessment of Agricultural Knowledge Systems) together with Paul Engel. Monique is a member of the National Steering Group of Prolinnova-South Africa and the Country Coordinator of PELUM (Participatory Ecological Land Use Management) in South Africa.

Hiroyuki Kubota

Hiroyuki Kubota is Executive Advisor to DG, Rural Development Department of the Japan International Cooperation Agency. After an MSc in soil science specialising in low productivity soil environments he joined the Japanese volunteer service to lecture on soil surveys and analysis in Tanzania. He spent a short time working on a biomass project in Sumatra Indonesia, thereafter joining the Japanese Foreign Service. Here, he has been working on policies around technical cooperation/emergency aid and aid coordination, and in the field (at embassies in Sri Lanka, Ireland and Ghana). In between he has worked for the World Bank and EBRD. He is currently in charge of JICA's drive on food productivity, particularly in SSA, focussing on productivity issues with a whole value chain perspective, liaison with the agricultural research community to maximize synergies between research and development/generation of technology and dissemination, as well as devoting significant efforts to international aid coordination and advocacy.

Dr Adrian Smith

Adrian Smith is a Research Fellow at SPRU and a member of the STEPS Centre and the Sussex Energy Group. Adrian has a first degree in Mechanical Engineering (Bristol), a Masters degree in Environmental Technology (Imperial College, London), and a DPhil in Science & Technology Policy Studies (Sussex). Adrian specialises in critical analysis of environmental policy processes; and research into relationships between technology, society and sustainable development.

Session 3: What opportunities are presented by the global redistribution of innovative activity?

Dr James Wilsdon

James Wilsdon is Director of the Science Policy Centre at the Royal Society, the UK's national academy of science. The SPC was established to provide high-quality scientific advice to policymakers, and to map and analyse the latest developments in science policy around the world as the Society prepares for its 350th anniversary in 2010. From 2001 to 2008, he worked at Demos, first as Head of Strategy, then Head of Science and Innovation, where he contributed to "China: the next science superpower?" and "The Atlas of Ideas: How Asian innovation can benefit us all."

Prof Xiulan Zhang

Xiulan Zhang is Professor and Director of the School of Social Development and Public Policy at Beijing Normal University, People's Republic of China. She obtained her PhD in social welfare from the University of California, Berkeley and is currently the national lead expert in social assistance; is a member of the Academic Advisory Committee of the Ministry of Civil Affairs, the Academic Advisory Committee of the National Aging Association, the Expert Committee of the State Council Urban Resident Health Insurance Evaluation Commission, and is the director of Social Safety Net Research Base of the Ministry of Education and the vice-president of the National Social Policy Association in China. She is on the board of the Institute of Development Studies (IDS).

Dr Suman Sahai

Suman Sahai originally trained in genetics, and held posts on the faculties at the University of Alberta, University of Chicago and Heidelberg University in the 1970s and 1980s before returning to her native India. There she founded the NGO Gene Campaign (which now has a presence in 17 states in India) in 1993, and has since been working on issues around bioresources, farmers' and community rights, intellectual property rights and indigenous knowledge, biopiracy, issues related with GE food and crops. Dr Sahai chaired the Planning Commission Task Force on Biodiversity and Genetically Engineered Organisms for the Eleventh Plan and has served on the National Biodiversity Board, the Expert Committee on Biotechnology Policy and the Bioethics Committee of the Indian Council of Medical Research. In recognition of her work, Dr Sahai was honoured with the order of the Golden Ark (Netherlands) in 2001.

Dr Anabel Marin

Anabel Marin is a research fellow at SPRU. Her initial training is in economics and this was followed by a Masters degree in industrial economy and development and a PhD in science and technology policy studies. Her broad area of research is concerned with innovation, development and international economics. Much of her work up to now has been on the effects of MNC activity on technological change and productivity in host developing countries. On this topic she has conducted studies on Argentina, India, Brazil and China. She is also currently involved in two projects on Latin America about innovation and diversification in industries based on natural resources. Underlying this work are analytical and policy interests in the association between structural change and development.

Session 4: Internationalisation of science, technology and innovation policy: What room for “constitutional” reform?

Professor Andy Stirling

Andy Stirling is Science Director at SPRU (science and technology policy research) at the University Sussex and co-directs the joint 'STEPS' Centre (on 'Social, Technological and Environmental Pathways to Sustainability') jointly hosted by the Institute for Development Studies and SPRU. With a background in astrophysics and science studies, he gained an MA (Hons) in archaeology and social anthropology (Edinburgh, 1984) and a DPhil in science and technology policy (Sussex, 1994). In the 1980's, he worked as a field archaeologist and then as a disarmament and environment activist, later serving on the Board of Directors for Greenpeace International in the 1990s. His current research focuses on various aspects of the governance of science and innovation. In particular, he has done work in the area of: (i) risk and technology assessment; (ii) uncertainty and precaution; (iii) the dynamics of technology change; (iv) issues in 'public engagement'; (v) transitions to sustainability; and (vi) diversity and resilience in technological systems. He is a member of editorial boards for three academic journals and author of more than eighty peer-reviewed papers. He has served on a number of government advisory bodies including the European Commission's Science in Society Advisory Committee, Expert Group on Science and Governance and Sustainable Development Advisory Committee. In the UK, he has been a member of the GM Science Review Panel, the Advisory Committee on Toxic Substances, the Science Advisory Council (environment ministry) and the public engagement Steering Group (innovation ministry).

Dr Des Turner MP

Des Turner is Member of Parliament for Brighton Kemptown, as well as being a Member of the House of Commons Science and Technology/ Innovation Committee. He has a special interest in renewable energy, and sat on the committee that scrutinised the UK Climate Change Bill in 2007. He does not intend to contest next year's general election.

Professor Sir Richard Jolly

Richard Jolly was previously director, and is now Honorary Professor and Research Associate of the Institute of Development Studies at the University of Sussex. He is co-director of the UN Intellectual History Project and has recently contributed to "Ahead of the Curve? UN Ideas and Global Challenges" (2001), "UN Contributions to Development Thinking and Practice" (2004) and "UN Ideas that Changed the World" (2009).

Professor Brian Wynne

Brian Wynne is Professor of Science Studies, and Associate Director of the ESRC Centre for Economic and Social Aspects of Genomics (CESAGEN) at Lancaster University. He is currently involved in Cesagen research on “bioknowledge economies, publics and sustainable innovation”, on UK-China networks of low-carbon innovation, and on technical and social aspects of modelling of zoonosis risks.

Responses from the international community, government, media, civil society and the private sector

David Dickson

David Dickson is the founding director of the Science and Development Network (Scidev.Net), a website devoted to news and analysis about science, technology and the developing world. A mathematics graduate by training, he worked briefly for the British Society for Social Responsibility in Science, and subsequently spent almost three decades

as a professional science journalist. As such, he has worked on publications that include The Times Higher Education Supplement, Nature, Science and New Scientist, specialising in reporting on developments in science and technology policy, and including spells reporting on these issues from Washington and Paris. He was appointed news editor of Nature in 1993, and left to set up SciDev.Net in 2001. He is the author of *Alternative Technology and the Politics of Technical Change* (London, 1973) and *The New Politics of Science* (University of Chicago Press, 1986).

Dr David Grimshaw

David is Head of the New Technologies International Programme with Practical Action and is currently seconded to the Kathmandu office in Nepal. The vision of this programme is: a world where science-led new technologies deliver products which fulfil human needs rather than consumer wants. He previously held academic positions at the University of Leeds and Warwick Business School, University of Warwick, and Cranfield School of Management. He has a PhD in information systems from Warwick Business School. Recently completed research includes *Connecting the First Mile*, *Podcasting in the Andes*, and *Nano-dialogues in Zimbabwe*. He has just completed collaboration with the Universities of Sussex, Lancaster, and Durham on an ESRC funded project entitled, "Delivering Public Value from New Technologies".

Joachim Voss

Joachim Voss, a citizen of Canada, joined the International Center for Tropical Agriculture (CIAT) as its Director General in January 2000 and retired from that position in January 2008. Prior to that he had worked from 1988-1999 with the International Development Research Centre in Canada, where his last post was as Senior Research Manager of IDRC's Research Division. Voss also worked as a Senior Scientist for CIAT's Central Africa Program during 1984-1988. He holds a Doctoral Degree of Philosophy on Economic Anthropology from the University of Toronto and a Master's in Rural Sociology from the University of Guelph. Voss has been Board member or chairperson of several international initiatives such as the Consortium for Sustainable Andean Development (CONDESAN), the CGIAR Gender Committee, the CGIAR Integrated Natural Resource Management Task Force, and the Multi-Stakeholder Forum on Intellectual Property and Access Rights in Plant Genetic Resources (CRUCIBLE). He has conducted research and published extensively on soil fertility management, farming systems, participatory breeding, indigenous knowledge, and social cultural aspects of development.

Christine Drury

Christine Drury is an independent consultant, and was previously NGO and Consumer Affairs Manager at Unilever.