# Science and Citizens: Global and Local Voices

Science and technology are key to tackling poverty and promoting better well-being in the modern world, as the Millennium Development Goals and the Commission for Africa's findings underline. But how can scientific and technological advances – often played out on a global or corporate stage – translate into innovations that will meet poor people's needs and concerns at a local level? How do rapid scientific advances and new technologies engage with issues of participation and accountability? And in what ways do these rapid changes challenge notions of citizenship and identity? Based on work undertaken by the Science and Citizens programme of the Citizenship, Participation and Accountability Development Research Centre, this IDS Policy Briefing argues that public engagement in scientific debates and policy processes is necessary to address how research agendas are framed and the social purposes they serve, and to ensure that poorer people and communities will benefit from them.

In diverse settings, both North and South, people are engaging with public issues involving science and technology. Citizens want to know what difference advances in fields such as medical genetics, agricultural biotechnology and genetically modified foods, HIV/AIDS and the environment will make to their lives. They want the right to be heard, to be understood and to understand. But what *are* their rights, who is accountable to whom, and how can people participate in debates and policy processes governing science and technology?

The Science and Citizens programme has been examining the ways in which science and technology studies connect and interact with development studies. Bringing these two fields together allows us to challenge dominant debates about the technical and objective nature of science, the nature of expertise, the framing of knowledge and research questions, and ways of thinking and being.

This Policy Briefing draws on examples of citizen engagement with science collected in the book *Science and Citizens: Globalisation and the Challenge of Engagement*. How can people ensure that their concerns are at the heart of scientific decisions and have faith that institutions and political powers are making the



*Treatment Action Campaign*

**Effective citizen mobilisation can change health care provision and research**

best possible choices? How do global directives transfer to regional and local contexts, which have both divergent and cross-cutting needs? As contributor Andy Stirling argues, the form and direction taken by science and technology are no longer seen as inevitable and monolithic, awaiting 'discovery' in nature. Instead they are increasingly recognised as being open to shaping by individual creativity, collective ingenuity, cultural priorities, institutional interests, stakeholder negotiation and the exercise of power.

## Key questions

- What new perspectives on the links between science, technical expertise and citizen participation emerge from comparing cases across different issues and settings?

- What difference does globalisation make to the policy processes which govern science and technology development?

- What does this tell us about approaches to risk, regulation and public participation?

- How might the notion of 'cognitive justice' – involving dialogue between the different knowledges and perspectives held by scientists and members of the public locally and globally – help to further debate and practice?

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Developing workers' capacity to collect data creates a bridge between their perspectives and the dominant framings of science and the law

## The policy context

There is growing interest and awareness among development policymakers of the role science and technology have to play in tackling poverty and its consequences for people's lives. For example, the Commission for Africa convened by the UK government in 2005 recommended funding more research and development in medicine and vaccines, as well as a major increase in agricultural research and innovation. As part of a broader programme of capacity building, it also recommended the commitment of US$3 billion over ten years to develop centres of excellence in science and technology in African institutes. But do such suggestions go far enough in engaging with the concerns of poor people and involving them in the decision-making process? Or will the plans provide islands of technical excellence, which fulfil donor requirements but are divorced from the lives of the people they are intended to help?

Science and technology issues offer a particular challenge for participation. They are associated with claims to highly specialised, professional knowledge and expertise that generally exclude ordinary citizens. However, controversies – increasingly of a global nature – have created new dimensions and needs for public engagement in decision-making.

While debates on participation in science frequently take place at a local level, the world is now too connected, and science and technology policy too globalised, for public engagement to be confined to the local sphere. Today's science and technology initiatives involve networks of institutions, researchers, funders, policy organisations, non-governmental and private sector actors that link national and local settings into globalised forms of governance, debates and ways of thinking. Equally, and at the same time, new internationalised networks and treaties affect and connect people across local sites.

With the tendency to view problems from an increasingly global perspective, poor people's own local needs and perspectives can be misrepresented. This can lead to technology developments that prove culturally unacceptable, or miss key opportunities that emerge from the local, context-specific conditions in which people live. A focus on the overall growth or health of a society may also miss the particular vulnerabilities of its very poorest or most marginalised members and their particular technology needs.

The opportunities and places citizens have for questioning experts, demanding evidence, asserting their own knowledge and claims will vary according to many factors – income, access and education among them. In an environmental perspective from Brazil, Angela Alonso and Valeriano Costa argue that three sets of issues are important in shaping the conditions for citizen mobilisation:

- The *mobilising structures* available to activists and citizens – how well organised and networked are individuals and groups, what resources do they have, what do they have to say and how do they say it?

- The *political arrangements* with which mobilisation interacts.

- The *social construction of environmental risks*, especially the relationship between the knowledge and values of affected actors and the claims made by scientific and technical discourses.

## Perspectives on knowledge and expertise

In a global context, and in relation to science and technology, what does citizen participation mean now and what should it mean in the future? Work in the new field of science and citizenship looks at how people are engaging with science and technology and examines lessons from the past that might help to shape this new globalised, hi-tech world. The work draws on debates that have been taking place in parallel in both the North and the South.

Since the 1970s, largely in relation to Northern industrial settings, science and technology studies have been examining issues of scientific and technological practice and culture, as well as public and policy responses to the risks of modern science. Over the same period, development studies, drawing on earlier anthropological traditions, has engaged with similar issues but largely in Southern settings; perhaps with a greater emphasis on the connections between technologies and livelihoods, and on the perspectives emerging from so-called 'indigenous knowledges' and the cultural worlds they inhabit, especially when engaging with outside interventions.

Each of these disciplines has developed their own concepts, analytical traditions and preoccupations. But in a world where the geographical North-South divide seems increasingly meaningless, researchers from the Science and Citizens programme have been looking at the exciting new possibilities that emerge when development studies and science and technology studies converge.

As the cases of citizens engaging with science debates – from the UK to South African townships, from Zimbabwe to urban Brazil – show, comparative lessons can be drawn from the ways in which politicians, practitioners and scientists behave in different settings and situations.

> " Global science can gain democratic legitimacy only if it understands itself in relation to other cultures and learns to negotiate and accommodate them rather than dismiss them as peripheral, untrustworthy or emotive. "

## THREE CASE STUDIES

### Seeds of controversy

'Golden rice' has been genetically modified to produce beta-carotene — a yellow-orange pigment our bodies can convert to vitamin A. In 2000, this much-heralded biotechnology was seen as a potential 'wonder-crop' able to feed the world's hungry and poor, and to help solve the severe problem of infant blindness afflicting hundreds of thousands of malnourished children. But these positive global views about golden rice seemed to sweep aside people's local experience with it and the broader questions they might raise. As Sheila Jasanoff describes, a substantial backlash formed and Vandana Shiva, India's celebrated feminist critic of biotechnology, was one of the counter-movement's most outspoken leaders. She asked about the impacts on rice biodiversity, whether the nutritional benefits were being overstated and more traditional local sources of vitamin A existed, and how the distribution of seeds would fit into the logistics of food supply in poor countries. Would private companies patent each trait of the product and thereby monopolise an essential food grain? Even advocates argued that golden rice was not the solution to the vitamin A deficiency problem and that the media campaign around the product had gone too far.

This example throws up salient themes in contemporary debates about biotechnology — in particular, food safety and security, product promotion and media hype, intellectual property and indigenous knowledge, the role of multilateral donors and multinational corporations, as well as post-colonial power relations among developed and developing countries.

### Grassroots globalisation

In a David and Goliath story from South Africa, described in the book by Steven Robins, the grassroots organisation Treatment Action Campaign (TAC) successfully used both local and global networks to fight for access to anti-retroviral drugs for working class and poor people, taking on the global pharmaceutical industry and international patenting laws.

A few years ago, virtually every aspect of the AIDS pandemic – from the statistics, to theories about the causal link between HIV and AIDS, to studies on drug therapy – led to disagreement with government on the one side and activists, scientists, health professionals and the media on the other. Matters came to a head in 2001 with the 'leak' of a South African Medical Research Council report that estimated that AIDS accounted for about 25 per cent of all deaths in the year 2000 and had become the biggest cause of death in South Africa. The government responded by challenging the findings, claiming they were alarmist and inaccurate.

But the country was in the midst of an epidemic of huge proportions. TAC was able to cut through the controversy raging within South Africa's scientific and political establishments over whether AIDS had a viral cause. TAC's mode of activism, dubbed 'grassroots mobilisation', was to use volunteers (many of them poor and unemployed women, many of them HIV-positive and desperate for access to drugs for themselves and their children) to go into schools, factories, community centres, churches, bars and door-to-door in the townships. In addition to its local work, it engaged with scientists, the media, the legal system, NGOs and government. By focusing on moral imperatives, TAC forced drug companies to lower their prices and it persuaded the Ministry of Health to make anti-retroviral drugs more widely available. But above and beyond its local approach, TAC also used sophisticated networking channels that crossed race, class, ethnic, occupational and educational lines, and in doing so captured the imagination of scientists and citizens in South Africa and abroad.

TAC was a struggle for poor people to gain access to life-saving drugs, but it was also a campaign to assert the rights of citizens to scientific knowledge, treatment information and the latest research findings.

### Demystifying science

In India's industrialised zones, health problems linked to occupational hazards and workplace conditions affect many workers, while others are at risk from industrial accidents and environmental pollution. Workers have accumulated much experiential expertise in such issues, but having their perspectives recognised and acted upon by government regulators or courts of law is another matter as Murlidhar V. argues.

Struggles to bring such knowledge into the public policy domain and seek justice for workers in the face of often appalling conditions has been central to the work of a network of activist groups and NGOs in Mumbai, the Occupational Health and Safety Centre (OHSC) and the Environmental and Occupational Health Section of the Society for Participatory Research in Asia (PRIA), over many years. The brokering role of such groups has been critical in interpreting and reframing workers' experiences to fit the concepts and standards of legitimacy of dominant scientific culture. At the same time, such groups have been intensively involved in developing the capacity of workers' groups and unions to collect diagnostic and monitoring data on occupational health issues. These included a long campaign around lung diseases created by dust emissions in textile factories. The aim has been to 'demystify' science, creating a bridge between workers' perspectives and the dominant framings of science and the law. The result has been the emergence of a sense of cognitive justice, where workers' insights are taken seriously, as well as the successful realisation of particular material rights – including access to treatment and compensation.

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## Implications for public engagement with science

A recent global opinion poll carried out by Gallup International, suggests widespread disillusionment with how governments represent their people. Mistrust predominates across the world, with less than a third of people believing their views are properly reflected. In this general climate of cynicism, global science can gain democratic legitimacy only if it understands itself in relation to other cultures and learns to negotiate with and accommodate them, rather than dismiss them as untrustworthy and emotive.

The main institutions involved with science and technology often hold particular social and political assumptions about the public and their needs – while at the same time obscuring these in technical explanations. The research of the Science and Citizens programme suggests that such explanations need to be made more explicit, while at the same time acknowledging that alternative ways of thinking and being exist and may be rooted in people's lives. As Robert Chambers famously has asked: "whose reality counts?"

There has been a rush in recent years to promote public participation in science and technology debates, through stakeholder forums, conferences, citizens' panels, focus groups and opinion polls, for example. But these tend to be orchestrated on the terms of their host institutions, whether those are local governments, aid agencies or activist NGOs. Where do these invited spaces sit within wider political contexts? Are they isolated and isolating, or are they a melting pot for broader processes of social and political transformation? And what of the institutional and political context within which participation takes place? Much will depend on the nature of the state, its relationship with civil society and the issue at hand. And all these may, depending on their form and context, offer opportunities for opening up debate, or they may have a closing down effect.

Approaches to involving poor people and those who represent them as partners in research and innovation deserve attention. Public engagement with science needs to be less dominated by narrow technical debates about risk, that engage the public only to promote acceptance or deflect controversy. Rather, policy thinking needs to 'move upstream' to encompass broader questions about how science and technology agendas are framed, the social purposes they serve, and who stands to gain or lose.

Global governance plays a key role in this. Heavily funded new global scientific initiatives such as the Global Fund to Fight AIDS, TB and Malaria are emerging and attracting increased funding. How can global treaties and technologies be reconciled with local needs? In many cases similar technologies are being presented as solutions to a range of problems in developing and developed countries alike, but in contexts which are very different – historically, economically, socially and politically. What of the implications of trade-related intellectual property rights (TRIPS) for pro-poor innovation, and the potentially crucial impact of global pressures to standardise and harmonise, for instance around agricultural and vaccine products or bioethical procedures in research?

By exploring how science and citizenship claims are emerging around different issues we can see how diverse knowledges evolve in different settings, according to particular histories and dynamics in relationships between science, states and international political economy and society. Policymakers, civil society and activist groups – together with researchers – should carefully consider what conditions and what avenues of participation offer routes to more vital forms of dissent, to genuine negotiation, and to political and practical solutions based on mutual recognition and respect. Specifically, participatory research approaches that involve user perspectives in setting research agendas, hybrids of local and scientific knowledge, learning alliances and networks, and the linking of innovation with delivery systems to meet poor people's needs, all need consideration and investment. Such approaches need to work in tandem with citizen mobilisation – through the media and internet, public protest and challenges through the courts for example. In other words, we need to think long and hard about how a new politics of science and citizenship can open up debates through participation and deliberation, rather than closing them down.

## Further reading

Melissa Leach, Ian Scoones and Brian Wynne (eds) (2005) *Science and Citizens: Globalisation and the Challenge of Engagement*, London: Zed Books

Melissa Leach and Ian Scoones (2006) *Making Technology work of the Poor*. London: Demos and Brighton: IDS (pamphlet forthcoming June, available at: www.ids.ac.uk/ids/KNOTS)

Further information and a series of working papers on Citizens, Science and Mobilisation may be found on the Citizenship DRC website: www.drc-citizenship.org

For details of the new MA course in Science, Society and Development at IDS, see www.ids.ac.uk/ids/ teach/mascience.html

## Credits

This Policy Briefing was written by **Ian Scoones**, **Melissa Leach** and **Kirsty Cockburn** and edited by **Caroline Knowles** based on the book *Science and Citizens: Globalisation and the Challenge of Engagement*. The book presents case studies and analysis carried out by the Science and Citizens research programme, through a series of activities and meetings supported by the IDS-based Development Research Centre on Citizenship, Participation and Accountability and the ESRC Science in Society research programme.

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