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Contentious politics, contentious knowledges: mobilising against GM crops in India, South Africa and Brazil

Ian Scoones

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INSTITUTE OF DEVELOPMENT STUDIES
Brighton, Sussex BN1 9RE
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Summary

Debates about science and technology are central to the future of development. No recent controversy has highlighted this as much as the debates about genetically-modified (GM) crops. Looking at the experiences of anti-GM activism in India, South Africa and Brazil, this paper explores how knowledge and politics are intertwined in mobilisation processes. These interactions are fundamentally shaped by different local and national contexts of history, politics and economics, but also influenced by global connections. Through a documentation of the unfolding of the anti-GM campaigns in the three sites over the past decade, the paper shows how strategic alliances have been formed – across actors and across debates – which have allowed concerns about GM crops to be inserted into public policy debates. The strategies and tactics used by anti-GM activist networks are explored across seven 'spaces' for citizen engagement: formal, invited spaces; informal networking and lobbying; party political and electoral processes; the legal process and the courts; research, practice and demonstration sites; protest and direct action; and the media. The case studies highlight the constraints and limitations of activist mobilisation, and how alternative knowledge framings and perspectives on science, technology and policy are often silenced. The paper concludes with a discussion of the ways forward, focusing on the need to bring consideration of wider politics and values into deliberations about future science and technology options, with a move beyond standard mechanisms and processes for deliberation and negotiation about science and technology policy.

Keywords: GM crops, mobilisation, South Africa, Brazil, India.

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Preface: DRC working paper series on citizens, science and mobilisation

Rapid advances in science and technology are accompanied by changing forms of public engagement, with implications for citizenship. There is evidence both of apparent crises of public confidence in science, linked to the emergence of new risks, uncertainties and threats thrown up by science, technology and its application. At the same time, certain local knowledge is being re-worked as citizen science, in which the public conducts research and engages critically with expert perspectives on scientific and technological issues.

The Citizens and Science Programme of the Citizenship DRC has been exploring emergent engagements between citizens and public issues involving science, and the processes of rights-claiming and participation involved. This inquiry has moved beyond institutionally-orchestrated attempts at public participation in science to look at more spontaneous forms of citizen mobilisation and activism around scientific and technological issues. Across a diversity of issues and contexts and drawing together perspectives from social movement theory and science studies, the Programme has asked:

- Who mobilises and who does not, and why?
- What are the patterns of experience, profiles and identities of activists?
- Within what spaces do debates about science and policy take place, and what processes of inclusion and exclusion exist?
- What forms of knowledge – including values, perceptions and experiences – frame these public engagements and movements?
- How are activist networks constituted, and what diverse forms do they take?
- How do science and scientists become enrolled in these networks?

Working Papers in the series include:

'MMR mobilisation: citizens and science in a British vaccine controversy', by Melissa Leach.

'Managing mobilisation? Participatory processes and dam building in South Africa, the Berg River Project', by Lisa Thompson.

'Contentious politics, contentious knowledge: mobilising against genetically-modified crops in India, South Africa and Brazil', by Ian Scoones.

'When social movements bypass the poor: asbestos pollution, international litigation and Griqua cultural identity', by Linda Waldman.

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'The formation of the Brazilian environmental movement', by Angela Alonso, Valeriano Costa and Débora Maciel.

'Contesting scarcity', by Lyla Mehta and Lisa Thompson.

'From "medical miracles" to normal(ised) medicine: aids treatment, activism and citizenship in the UK and South Africa', by Steven Robins.

1 Introduction

This paper explores the dynamics of mobilisation around GM[1] crops in three countries – India, South Africa and Brazil. By examining the role of science in different 'spaces' where contests over GM crops occur, the paper investigates how science and politics are intertwined, and how relations of knowledge help define both the nature of citizenship and the scope for participation around this issue. By bringing the politics of knowledge centrally into the examination of activism, mobilisation and social movements, the aim is to relate more conventional understandings of contentious politics with less explored understandings of contentious knowledges, so linking analytical perspectives often treated separately.

The literature on social movements and activism – and more generally political science perspectives on 'contentious politics' (cf. Tarrow 1998; McAdam *et al.* 2003; Tilly 1978) – defines the nature of collective action according to the combined effects of 'political opportunity structures', 'resource mobilisation' and 'framing' (McAdam *et al.* 2003). In such studies the politics of knowledge is however often underemphasised.[2] This paper focuses particularly on the interactions between politics and knowledge: the way debates are framed and the relationships between political contests, identities and ways of knowing. Indeed, many contests over knowledge – characterised by the struggles of 'new' social movements (Offe 1985) – are less about 'facts', but more about values and symbols (Melucci 1985), 'ways of life' (cf. Touraine 1992) and identities (cf. Melucci 1989; Castells 1996, 1997).

Knowledge politics are particularly highlighted by the GM case. As disputes about science and technology come to define contentious politics – beyond more conventional issues like labour rights, or access to land and resources – there is a need to bring in wider perspectives – for example from science studies and the sociology of science – to an examination of mobilisation, activism and movement politics. As highlighted by Epstein (1996) in his examination of HIV/AIDS activism in the US, this linkage has to date been little explored.[3] This paper is an attempt to extend and elaborate the interaction between two largely distinct literatures, bringing the politics of knowledge to the fore.

The aim of this paper is thus to look at how knowledge is deployed – and science constructed – in different spaces of engagement used by activists campaigning against GM crops. A variety of typologies of 'spaces' for participation and public engagement in processes of deliberation and policy-making have been offered recently (e.g. Cornwall and Gaventa 2001; Cornwall 2004). Each differentiates between so-called 'formal' , 'invited' spaces, created usually by state actors as sites for involving citizens in discussions, and 'informal' spaces created by citizens themselves, either through popular action, informal lobbying and networking, demonstrations of different sorts, or through the use of the media, for example. Cutting across this formal/informal axis are a range of other hybrid spaces, where, for example, citizens create

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1 The focus here is on transgenic products where genes are transferred across species boundaries. This is only one facet of crop biotechnology, but the one that has caused the most public concern as transgenic products raise a number of biosafety issues, including potential risks to environment/biodiversity and human or animal health.

2 Contentious politics scholars who do focus on knowledge issues look at 'framing', but often from a social psychology angle (see Snow *et al.* 1986; Benford and Snow 2000).

3 Although see the classic work on toxic waste in the US (e.g. Brown and Mikkelsen 1990; Brown 1992, 1995; Szasz and Meusser 1994).

spaces within formal institutions – such as the legal system and courts, or electoral processes. For the purposes of discussion in this paper the aim is not to come to a definitive typology, but more to aid description and analysis of processes.

In the cases that follow several 'spaces' – with overlaps – have been identified:

- Invited spaces for discussion including workshops, conferences and debates;
- Informal lobbying and networking;
- Electoral and parliamentary processes, including the role of political parties and parliamentary committee processes;
- Legal processes and the courts, including constitutional challenges, deploying a broad rights focus, and public interest litigation around statutory requirements;
- Activist and action research, including field demonstrations and visits around alternatives;
- Various media, including Internet cyber-media, newspapers, television etc.;
- Protest and direct action.

Each of these 'spaces' has potentially both 'local' and 'global' dimensions. Much existing debate has appropriately focused on how fairly localised processes of citizen participation and deliberation have played out in spaces ranging from local associations and committees to national level processes. The GM case is, however, a 'global' issue par excellence. GM crops are based on a technology with international connections, promoted by multinationals with global ambitions. This is matched by a network of activism that stretches across the world, connected by the Internet and links between activist groups and by a sense that the struggle against GM should be located both in local issues, and also in global ones of ethics and ecology.

But does this add up to a globalised activism, a global civil society made up of global citizens (cf. Edwards and Gaventa 2001; Keane 2003)? This literature argues that, because issues are increasingly debated in global terms, the challenges of accountability must stretch to international institutions and global players in the corporate sector. We must therefore move beyond a state-centric view to encompass wider notions of civic action and society. Is there a possibility of 'globalisation-from-below' or 'grassroots globalisation' (cf. Appadurai 2000, 2002), whereby inter-connected local actions accrete to have wider effects? By tracing connections from the national settings which are the focus of this analysis to the international arena, and by examining links between the three countries, we can make an assessment of the degree to which anti-GM activism adds up to a 'global movement'.

Examining the contentious politics and knowledges of GM crops across three countries is a wildly ambitious task. This paper can therefore offer only the beginnings of a more complete analysis. The study starts with a located approach, focusing on the 'the messy, close up view of collective action' (Edelman 2001: 286). By detailing the timelines of anti-GM activism in each site, looking at key events, conjunctures and 'cycles of contention' (cf. Tarrow 1993), each country case highlights the varied mobilisation

'repertoires' deployed (Tilly 1978) in the range of spaces identified where knowledge-politics interactions take place. For each country case, the aim has been to focus on key events and conjunctures over a ten year period, and to set this analysis in a wider historical view of mobilisation and politics.

The empirical material presented is largely based on semi-structured interviews with key players[4]. These focused on reconstructing events chronologically in order to identify the range of engagement spaces and their interactions, and the actors and networks involved. Interviews also developed biographies of individuals and organisations, situating their involvement in the anti-GM debate in a wider context. The interview work was combined with archival analysis of documents – including official government records, activist organisation publications and newspaper articles. There are a number of limitations of this research: first, the fieldwork period was limited, and the breadth of the comparative approach constrained the depth of analysis in any one site. Second, the informants are in some respects 'the usual suspects'. An initial list of interviewees was derived from an internet survey of key actors, and then snowball sampling identified others. But those who appear on the internet tend to be the more mainstream activists, part of the globalised network of anti-GM players, rather than the less conspicuous, perhaps less globally-connected, individuals and groups who nevertheless remain important players. While attempts were made to identify such people, time limitations constrained a thorough search. Finally, research locations reinforce this bias. In India, the work was carried out largely in Bangalore, with some complementary interviews in Delhi and Chennai. In South Africa, interviews were carried out in Cape Town with some limited phone/email contact with Johannesburg-based informants. And in Brazil, the interviews were carried out in São Paulo and Rio de Janeiro. These are all large, urban centres with significant middle-class populations, and strong non-government organisation (NGO) presence. They are part of the metropolitan, relatively elite circuits where the higher profile activist networks are centred, not the deprived rural hinterlands, where a different activist discourse may be present. Bearing these limitations in mind, the research was able to provide an insight into some important facets of anti-GM activism in three continents.[5] Similarities and contrasts were defined, and a comparable set of questions asked, leading to a comparative analysis that goes beyond the location-specific assessments of much other work.

The research asked, for different spaces of engagement, three interlinked questions: how is science deployed and in what way; what are connections to global arenas and debates; and what does this imply for the way citizenship (local and global) is constructed? Section 2 introduces the country cases, highlighting how and when anti-GM activism emerged in each country. Section 3 examines the wider contexts within which such activism must be understood, again emphasising the three contrasting national settings. Section 4 moves to an analysis of activism in practice, looking in turn at each of the 'spaces' for engagement used. Section 5 explores the links between knowledge, science and mobilisation, and the final section draws conclusions.

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4 A total of over 70 detailed interviews were carried out as part of this research in India (largely February 2004), in South Africa (March 2004) and in Brazil (largely April 2004). Work in India built on longer term research between 2000 and 2004 on this theme (Scoones 2005).

5 A growing literature describes the European experience (e.g. Wynne 2001; Toke 2001, 2004; Reed 2002), however there are fewer analyses of the developing world contexts, particularly through a comparative lens.

2 Country case: introductory profiles

The GM story in the three countries goes back around a decade. In India transgenic material – Monsanto's *Bt* product[6] – was first imported in 1995 by the seed company Mayhco, as part of a joint-venture with the US-based multinational. The importation of 100g of *Bt* cotton seed was approved by the Department for Biotechnology (DBT) according to 1989 regulations. *Bt* cotton crops were not approved for commercial release until March 2002, although several years of illegal plantings of 'pirated' GM cotton had occurred previously. In South Africa, the first *Bt* cotton trials were started by Monsanto in 1992 under the apartheid regime, with transgenic cotton released for commercial use in 1997. In 1998 yellow *Bt* maize was also commercialised, with *Bt* white maize following in 2000. The South Africa GMO Act was passed in 1997, but did not come into effect until the end of 1999. In Brazil the 1995 Biosafety Law created the regulatory authority CTNBio (the National Technical Commission on Biosecurity), which in 1997 approved the first trial of Monsanto's 'round-up ready' herbicide-tolerant GM soya. This was only formally approved for sale in 2002, following long wrangles in the courts and a series of provisional measures granted by the president (cf. Jepson 2002). In March 2005, the President ratified a new Biosafety Law giving CTNBio the authority to approve plantings.[7]

In 2004, the total area under GM crops in the three countries was 5 m ha in Brazil (22 per cent of the soya area), 0.5 m ha in South Africa (15 per cent of maize area) and 0.5 m ha in India (6 per cent of the cotton area) (James 2004) making up 8 per cent of global GM planting. Despite the relatively small area under commercial planting, the decisions of these countries had great significance globally, and for each of their respective continents. Together with China and Argentina, they were the first developing countries to commercialise GM crops and are seen by Monsanto and the other multinationals as key bridgeheads to wider global acceptance, particularly in the developing world. As large countries with significant rural populations[8] – including, in South Africa and Brazil, large-scale, commercial farming concerns – they are also potentially important markets in themselves.[9] However, the arrival of GM crops has not occurred quietly. Over the past decade a storm of protest has erupted in all three places, fuelled by a variety of

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6 *Bt* cotton is a transgenic product based on the insertion of the Cry1a gene from the bacterium Bacillus thuringensis. It confers resistance to some insect pests, notably the bollworm Helicoverpa armigera.

7 For details on India see Ghosh and Ramanaiah (2000); Srinivas (2002) and Gene Campaign (2005: 'The story of *Bt* cotton in India', CDRom); on South Africa see Biowatch (www.biowatch.org.za) and on Brazil see Bulletins of GM Free Brazil campaign.

8 The total populations of Brazil, India and South Africa are respectively 176.6 million, 1.1 billion and 45.3 million. GDP (US$) is respectively 492.3 bn, 599.9 bn, and 159.9 bn. GNI per capita (US$) is 2710, 530 and 2780, although Brazil and South Africa show some of the most skewed distributions in the world. Agriculture makes up 6–7 per cent of Brazil's GDP, 22–25 per cent of India's and only 3.5–4 per cent of South Africa's (although this is known to be under-reported) (www.worldbank.org/data/countrydata/countrydata.html). All three countries are 'medium level' in terms of human development according to UNDP, with Brazil ranked at 72, India at 127 and South Africa at 119 out of a total of 177 (www.hdr.undp.org, 2004 listings).

9 India is the third largest producer of cotton in the world (after China and the US), with 16000 bales produced in 2003–04. Brazil is the fifth largest cotton producer, with 5830 bales produced in the 2003–04 season. After the US, Brazil is the largest soybean producer, with 52.6 million tonnes produced in 2003–04.

groups, intense media interest and a growing global debate. Debates have centred on commercialisation decisions for the first GM crops in each of the three countries; scares about the prospects of 'terminator' genes,[10] and wider concerns about patenting, corporate control and global trade.

In all three countries this period saw a number of existing groups switch attention to the GM issue, and new anti-GM groups emerge. New alliances and networks were made at national, regional, and global levels. The following sections give some background to the GM issues in the three countries, documenting the timeline of key events, and introducing some of the main actors involved. This sets the scene for the subsequent analyses of how knowledge and politics collide around the GM issue.

2.1 India[11]

In India, debate about GM crops was brought to national media attention for the first time in 1998 around the so-called 'terminator' controversy.[12] Monsanto's importation of transgenic cotton raised fears that such a product would include – in the labelling of the global anti-GM activists, notably RAFI (Rural Advancement Foundation International, based in Canada) and GRAIN (Genetic Resources Action International, based in Spain) – a terminator gene, which would prevent replanting and make farmers reliant year-on-year on the seed companies. This was emotive stuff, and highly effective in raising fears, despite Monsanto's strenuous denials.[13] These fears touched many chords. For some, *Bt* cotton became symbolic of a much wider struggle against the dominance of multinational capital, particular forms of technological modernisation and globalisation more generally. Thus alliances were forged between those concerned with the protection of indigenous crop varieties in dryland farming areas, nationalists interested in protecting the Indian economy and culture from outside influences and anti-globalisation protestors, linked to an international network of activists.

By mid-1998 a public relations battle was on. Monsanto launched a series of adverts in the press. At the same time, NGO groups launched the 'Monsanto Quit India' campaign to heighten awareness.[14] Although it was well-known that field trials had been established, details of trial sites became public only in November 1998 under media pressure and from state governments furious at the lack of coordination with them.[15] The KRRS (Karnataka Rajya Ryota Sangha, the now split Karnataka farmers' movement)

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10 'Terminator' genes refer to Genetic Use Restriction Technologies (GURTs), where inserted genes prevent use in the following generations. Despite the furore over this technology, it has not as yet been released (see Srinivasan and Thirtle 2000).

11 This section is based in part on a section of Chapter 8 of Scoones (2005).

12 See, for example, articles by Gail Omvedt 'Terminating choice' and Vandana Shiva, 'Terminating freedom' (*Hindu*, 26 December 1998). See also: 'Terminator seeds not permitted in India: agric minister', *Economic Times*, 3 December 1998; 'Terminator gene is not being used, says MNC', *Indian Express*, 3 December 1998; 'Seeds of conspiracy', *Hindustan Times*, 3 December 1998.

13 See 'Monsanto releases educative ads', *Financial Express*, 8 December 1998.

14 See 'Indians fight biotechnology giants: implement 'operate cremate Monsanto', 'Monsanto quit India' campaign, press release RSFTE, New Delhi. Also 'KRRS threatens to throw out Monsanto', *Times of India*, 23 November 1999.

15 For example, Karnataka Agriculture Minister, Byre Gowda indicated he had been informed of the presence of trials, but had no idea where they were ('Seeds of controversy', *Indian Express*, 18 November 1998). Only on 24 November did he release details of where the four locations were in Raichur, Bellary and Haveri.

immediately announced the 'Cremate Monsanto' campaign. The late KRRS leader, Professor M.D. Nanjundaswamy[16] identified a series of slogans: 'Stop Genetic Engineering', 'No Patents on Life', 'Cremate Monsanto' and 'Bury the WTO'. He gave notice that all trial sites in the southern Indian state of Karnataka would be burned, with the media in attendance.[17] The US embassy, in turn, requested police protection for US companies in Bangalore, and the High Court of Karnataka ruled to protect sites and the property of the Mayhco seed firm.[18] In Bellary and Raichur districts of Karnataka, trial farmers agreed to the crop-burning. In a move which pre-empted further protests, and in a sign of annoyance that they had not been adequately informed, the Andhra Pradesh government banned the trials, and requested that they be moved to an agricultural university to allow more thorough state-level scrutiny.[19] By December, the KRRS threatened to launch a criminal case under the Union Seed Act in magistrates' courts against Monsanto, as well as the state and central government, on the basis that trials were illegal.[20]

The media debate continued at a high pitch through 1999, with plenty of opportunity for press commentary prompted by a number of workshops and conferences.[21] By this time, the debate and coverage offered greater depth than earlier discussions around terminator technology. Monsanto, though, were still in the spotlight following their attempts to import plasmids for transgenic crop research at their Bangalore research centre.[22] There were by now some more concerted counter moves by the pro-GM lobby, with interventions from non-resident Indian scientists (most notably C.S. Prakash, from Tuskagee USA who made several visits to India and managed to place a wide range of articles in the press), other farmer leaders (including Sharad Joshi of Shektari Sanghatana and Chengal Reddy of the Andhra Pradesh Farmers' Association)[23] and industry commentators, including a more measured contribution from Monsanto which had commissioned a public opinion survey unsurprisingly showing how farmers were in support of biotechnology.[24] With the exception of a few regular commentators from the scientific

16 See various press obituaries on his death, for example; 'Champion of farmers' causes' *Deccan Herald*, 4 February 2004.

17 The first burning took place on 28 November 1998 with the consent of the farmer. Activists from KRRS along with the (little known) 'Progressive Front', 'Action Front for the Untouchables', 'Karnataka Liberation Front' and the 'Organisation of the Landless', according to a press release from KRRS, Bangalore. The burning was also attended by a five member team from the Geneva based 'Global People's Action Group' according to *Indian Express*, 30 November 1998.

18 See 'Police protection to all American companies in Bangalore city', *Samytkta Karnataka*, 25 November 1998.

19 'Monsanto told to stop field trials', *Indian Express*, 3 December 1998.

20 'KRRS to file criminal case against Monsanto', *Deccan Herald*, 18 December 1998; 'KRRS will destroy *Bt* cotton crop in Bellary today. Says it will file criminal cases against Monsanto, state and central govts', *Times of India,* 2 December 1998.

21 For example, the TERI 'stakeholder dialogues' (see *Economic Times*, 26 November 1999); the National Science Summit in Bangalore (*Times of India*, 9 August 1999); the 86th Science Congress in Chennai (*Indian Express*, 1 February 1999); the MSSRF national consultation on GM plants also held in Chennai (*Business Line*, 13 January 1999); and the UAS–Bangalore seminar on 'Environmental and Health risks associated with transgenic plants' (*Times of India*, 23 December 1998).

22 See 'Monsanto proposal to genetically alter rice draws flak', *Economic Times*, 6 August 1999; 'Monsanto turns to food crops', *Hindu*, 6 August 1999.

23 'Farmer leader pleads for immediate release of GM crops in India', *Financial Express*, 24 April 2000; 'Yielding positive results: gene revolution as farming aid' by Chengal Reddy, *Financial Express*, December 2000.

24 'Farmers support biotech use for increasing yield – Monsanto study', *Financial Express*, 31 August 1999.

community[25] there remained very few local Indian scientists prepared to enter the fray, although the likes of the Nobel laureate, and Green Revolution hero, Norman Borlaug were not shy of offering their opinion in pieces placed in the Indian press.

Soon after *Bt* material was imported, objections were raised and presented as a court petition by the Research Foundation for Science Technology and Ecology (RFSTE), headed by Vandana Shiva, disputing the form and content of the regulations (Shiva *et al.* 1999).[26] Since then, the courts have seen continued action, with public interest litigation following thick-and-fast. The RFSTE petition involved extensive hearings at the Supreme Court and vast amounts of evidence. A Delhi High Court action by Gene Campaign in 2001 claimed that the illegal sales of GM seeds in Gujarat were made with the knowledge of the government.[27] A further petition by the Gene Campaign argued for the right to information disclosure on trial results under the Freedom of Information Act.[28]

Other more direct forms of protest have also continued, with the KRRS active in crop-burning media events, and arguing for a five-year moratorium on GM seeds,[29] following the pattern of the established European 'freeze' campaign. Protests have occurred in a variety of places, including regular rallies and demonstrations at Monsanto's former India research headquarters at IISc in Bangalore.[30] Events such as the citizens' juries in Karnataka in 2000 and in Andhra Pradesh in 2001 have also provided foci for activists to denounce GM crops and the associated future for agriculture.[31] Media interest has remained high, with competing internet-based services providing alternative views on the Indian scene.[32]

The formal release of *Bt* cotton in 2002 provoked more protests from KRRS. Attempts at crop burning during 2002 had mixed results as before, with some farmers accepting compensation from KRRS protestors for the public destruction of their crop, while others firmly refused such advances and called in the police. In the last few years, protests have been more muted. In part this was because of the failing health of Nanjundaswamy prior to his death in February 2004. With his grip on the KRRS faction he controlled faltering, a less coordinated and energetic campaign was evident. However, others remained active. Gene Campaign, for example, held a high-profile conference in Delhi which argued for an overhaul

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25 See for example 'India definitely needs transgenic technology', *Economic Times*, 24 August 2001.

26 See also Shiva S (1993, 2001) and Shiva V *et al.* (2000) for a flavour of the wider activist arguments.

27 *Business Line*, 23 November 2001.

28 Gene Campaign president Suman Suhai wrote to the National Academy of Agricultural Sciences head, V.L. Chopra, requesting that they oversee the release of the trial data for public scrutiny. She claimed that the current situation contravened the Freedom of Information Act (see *Deccan Herald*, 8 August 2002). Reports in early 2003 suggest that this pressure has had some effect. A high level inter-ministerial meeting was held in February 2003 and a commitment made to make the field trial results public. This however would be limited by commercial confidentiality considerations, such that key data like the level of *Bt* expression in cotton plants would not be made available (*Deccan Herald*, 27 February 2003).

29 'KRRS opposes commercial release of *Bt* cotton seeds', *Economic Times*, 20 June 2001.

30 See 'Demand for Monsanto's ouster picks up. Karnataka bans Monsanto's *Bt* cotton seeds', *Agbioindia,* 11 August 2002, and *Deccan Herald*, 9 August 2002.

31 See ActionAid (2000); Pimbert and Wakeford (2002).

32 For example, AgBioIndia (www.Agbioindia.org),supported by Delhi based activist Devinder Sharma; more international lists (including bio_activists@iatp.org) with a more sceptical crops stance, and Monsanto India (www.monsantoindia.com) taking more pro-biotech positions.

of the regulatory system.[33] Meanwhile, Greenpeace, with their India office now located in Bangalore, were gearing up for consumer-based protests in shopping outlets, and eye-catching protests around regulatory discussions.

In 2003 and 2004 protests continued,[34] but many activists had their eye on the three-year review of the *Bt* cotton results in 2005.[35] Much was invested in providing alternative evidence based on surveys in the cotton areas which would demonstrate the limits of the technology. Many campaign-focused NGOs also had begun to see the anti-GM campaign as inherently limiting, and were keen to provide the other side of the story, developing a narrative about possible alternatives. For example, the Karnataka Coalition Against GM Crops, which initially formed to highlight the implications of the Nanjing report from China on *Bt* cotton,[36] developed links between a range of groups, including those very much located within the alternative agriculture movement in India and beyond.[37]

2.2 South Africa

In 1997 the campaign and research group, Biowatch, was formed in South Africa by a small group led by a former university biological scientist, Rachel Wynberg. Biowatch had a relatively low-key start involving a series of workshops, debates and commissioned papers focusing on issues such as labelling and segregation.[38] By 2000 an allied organisation, Safeage (the South African Freeze Alliance on Genetic Engineering)[39] had been launched, inspired by the European 'freeze campaign'. Led by a Cape Town based activist, Glenn Ashton, Safeage raised the tempo with a media-oriented strategy of raising awareness of the GM issue. Regular newspaper articles, TV slots and appearances on talk radio meant that GM arrived as a public issue.[40] The emerging coalition of groups organised a number of high-profile events, pulling in global anti-GM luminaries like Vandana Shiva from India and Tewolde Berhan Egziabher from Ethiopia.

An industry-funded pro-GM organisation, AfricaBio was launched in the late 1990s as a counter to this growing civil society activism.[41] It has attempted to occupy the scientific high-ground, legitimising its stance in terms of scientific expertise.[42] AfricaBio has also taken to the international stage, with briefings in Europe and the US on African biotechnology issues. With close links to the ISAAA (International

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33 See genecampaign.org press release.

34 See Visvanathan (2003) and Parmar and Visvanathan (2003) for perspectives on the Indian case.

35 Interview, Greenpeace, Bangalore, February 2004.

36 See 'Chief Minister urged to halt introduction of *Bt* cotton in Karnataka in light of Chinese findings', Press release, Bangalore 8 June 2002, www.ngin.tripod.com/220602b.htm.

37 Interview, ICAR, Bangalore, February 2004.

38 See www.biowatch.org.za.

39 www.safeage.org.za.

40 For press coverage of anti-GM campaigning activities, see for example: 'Open wide for GM bite', *Business Day*, 6 February 2004; 'Government hands out free GE seeds in South Africa', *Mercury*, 27 August 2003; 'Biowatch SA says modified organisms need regulation, *Business Day* 20 August 2003; 'SA receives bulk shipments of Frankenfoods', *Mail and Guardian*, 25 February 2000.

41 See Africabio.com for details of the organisation, its aims and membership. Also see a more sceptical commentary in 'GM crops: a continent divided', *Nature*, 20 November 2003.

42 See for example: 'Statement of the participants at the Africa Biotechnology Experts Working Group, Entebbe, March 2005', www.africabio.com/press/statement

Service for the Acquisition of Agri-Biotechnology Applications) and Florence Wambugu's Africa Harvest Biotechnology Foundation International, AfricaBio is seen by the pro-GM lobby as a key ally. In South Africa there have been frequent, somewhat staged confrontations between opposing sides on the GM debate, almost always with the same people on the platform.[43]

The debate, however, was dominated almost exclusively by white, middle class, well-educated activists with bases in Cape Town, Johannesburg or Durban. In the post-apartheid era, left-leaning white activists who had been part of the struggle in various ways before 1994 found themselves in an uneasy position. Largely excluded from the new government machinery, they found themselves in a variety of NGOs that had to refashion their existence to the context of the 'new' South Africa. With race such an identifier, the lack of black activists in the anti-GM groupings has been a source of concern and reflection. Attempts have been made to reach out to a broader constituency through links to other organisations as part of building a firmer coalition. Thus unions (e.g. the Food and Allied Workers Union), farmer groups (the Organic Agriculture Association of South Africa) consumer groups (the National Consumer Forum; the Safe Food Coalition) rights-based organisations (the Environmental Justice Networking Forum), development and environment organisations (Environment Monitoring Group; the World Conservation Union, South Africa), faith groups (including the South African Council of Churches,[44] the Pietermaritzberg Agency for Christian Awareness; the Ecumenical Service for socio-economic transformation), conservation groups (Botanical and Wildlife Societies of South Africa), and green groups (Earthlife Africa, Earth Women, Trees for Africa) have all been involved in the campaigns. Safeage argues that it is an alliance of over 200,000 people in South Africa. At face value it sounds impressive, but these are rather notional affiliations at best, and the original core remains the main focus.

Making links with regional players has also been an important strategy. A number of strong links have been made – for example with the Biotechnology Trust of Zimbabwe (BTZ) and to the Institute of Sustainable Development in Ethiopia headed by Tewolde Berhan Egziabher. Links to international campaigning groups have also been important, including to the Malaysia-based Third World Network, RFSTE in India, and northern-based anti-GM activists associated with GRAIN, RAFI and others. The World Summit on Sustainable Development, held in Johannesburg in September 2002, was an important meeting point, with many parallel workshops devoted to GM issues, and South African participants from a range of organisations were very much involved (Friedberg and Horowitz 2004).

This international work has boosted confidence and legitimacy for work at home which has become increasingly focused on strategic interventions in legal processes combined with some profile-raising protest actions. In August 2002, Biowatch served court papers on the National Department of Agriculture

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43 From the pro-GM side – Jennifer Thompson (University of Cape Town professor and author of 'Genes for Africa'), Jocelyn Webster (Executive director of AfricaBio) and Muffy Koch (biosafety training consultant, Golden Genomics) – sometimes supported by the Monsanto-hired PR company Hans Lombard, and on the anti-GM side, Glenn Ashton (Safeage), Rachel Wynberg and Elfrieda Pshcorn-Strauss (formerly Biowatch) and Miriam Mayet (African Centre for Biosafety) usually joined the platform.

44 See 'Food is Life' statement, www.wcc-coe.org/wcc/what/jpc/gmos.html; see also 'Archbishop slams use of GM crops', *Sunday Argus*, 23 May 2004.

(NDA), who were joined by Monsanto the following year as co-defendants in a case focusing on constitutional rights to access to information on GM trials and approvals. The court hearings were finally held during 2004 with a judgement in favour of Biowatch's case delivered in February 2005. A similarly protracted case involving the approval of Syngenta's Bt11 maize was filed by Biowatch in 2002. The appeal board case was only heard in 2004, with the appeal dismissed, although conditions on Syngenta were applied.[45] In parallel, intensive work with the parliamentary portfolio committees of Agriculture and Land Affairs and Environment occurred, focusing on the bill amending the 1997 GMO Act. The new provisions were finally passed in 2004, prompting a full-scale response from Biowatch.[46]

Meanwhile, Safeage – together with a few of the more activist environmental groups, such as Earthlife Africa, Environmental Justice Networking Forum, Earth Women, Ekogaia – engaged in popular protests aimed at the retailing chains, highlighting issues of labelling in particular. Consumption boycotts – picking up on apartheid era protest tactics – were focused on outlets such as Pick n' Pay and Woolworths. Trolley runs (where protestors fill supermarket trolleys with goods and request that they are checked for GM products) provided a focus for further media coverage.

In 2005, following the court success by Biowatch, the pro-GM lobby group AfricaBio issued a vituperative statement entitled 'Thoughtless activists continue to misinform and mislead the public'.[47] They claimed that anti-GM activities were undermining human rights and were fuelled by newspaper editors who did not check their facts. The statement claimed that the anti-GM campaigns were part of:

> … a well-orchestrated campaign financed to the tune of some $70 million a year by foundations, organic food interests, EU governments, and even UN agencies and programmes. It employs moratoriums and threats against agricultural imports from countries that grow biotech crops, complex and expensive requirements for labeling all GM ingredients and tracking them from seed to store shelf, even outright lies about the safety of biotechnology.

A decade ago, GM crops were barely a concern in South Africa. The government, together with industry and a small cabal of scientists, set the terms. Today, this has all changed. A combination of high-profile court cases, ongoing demonstrations, a growing media profile and long-term engagement with legislators, bureaucrats and scientists has meant that the GM debate has been opened up to greater scrutiny.[48]

2.3 Brazil

In Brazil much anti-GM activism has centred on the courts. In 1997, Greenpeace-Brazil filed an unsuccessful lawsuit against the importation of GMOs. In 1998, CTNBio, the government regulatory

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45 For full details of the court cases, submissions and judgements, see www.biowatch.org.za

46 See details of all these actions at www.biowatch.org.za

47 See www.africabio.com/press/biowatch.pdf. See also 'Frantic efforts by GM activists to influence public on GM food', 20 May 2004, press release, AfricaBio.

48 See, for example, recent cases: 'Dow Agrosciences field trials of GM maize blocked', www.biosafetyafrica/media, 25 January 2005; 'Court orders government to lift veil on GMO decisions', www.biowatch.org.za, 24 February 2005.

authority, approved five round-up ready soya varieties for controlled and monitored commercial release. The consumer organisation, IDEC (Instituto Brasileiro de Defesa do Consumidor)[49] immediately responded by filing another lawsuit with a federal judge to prevent release. Eventually, an injunction against commercial release was issued by Federal Judge Antionio Prudente in December 1998. Through 1999 protests increased, with much media coverage[50] and attempts to get state-level governments to create obstacles to further expansion of GM cropping. In March 1999, Governor Dutra of Rio Grande state issued a decree requiring a special licensing system for GM companies in the state, and the Rio Grande government ordered Monsanto to provide detailed environmental impact assessments for its operations. Monsanto later successfully sought an injunction to prevent state government intervention in its research station operations. But, thanks to effective state-level agitations, the governor responded by declaring the state 'GM free' later in the year. This decision was queried by the state legislature the following year, but nevertheless created the appropriate media profile, raised the tempo, and focussed attention on state-level actions.

Meanwhile, at federal level a growing NGO and political party grouping – involving IDEC, IBAMA (the Brazilian Environment ministry's Institute for the Environment and Renewable Natural Resources) and the PT (Workers' Party) had sought legal intervention to reverse decisions being made by the Agriculture Ministry. The ministry had sought to authorise registration of GM soya varieties without a formal environmental impact assessment, which, the complainants argued, was required by law. In August 1999, a federal judge turned the temporary injunctions issued against planting of GM crops into an official court decision.[51] Monsanto appealed against the decision, and continued to lobby hard with government, confirming its future intentions by starting work on a major US$550 million herbicide plant in Bahia state in early 2000.[52]

IDEC and Greenpeace meanwhile began to emphasise consumer awareness and boycotts. This focused on the urban, middle class consumers of the major conurbations, a significant group in Brazil. Drawing on IDEC's strong credentials as a consumer organisation and Greenpeace's international experience with consumer boycotts, this approach began to capture media attention. In June 2000 they announced that eleven GM food products were on the shelves of Brazilian supermarkets. Through the latter part of 2000 and into 2001, Greenpeace led protests at supermarkets across the country.[53]

Challenging importation of GM products was another tactic deployed at this time. Greenpeace went to court to prevent the shipping of two large container boats from San Francisco of GM maize for

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49 www.idec.org.br

50 From English-language press internet searches for 1999 e.g. 'Brazil State Pays Farmers to Rip Out GM Soybeans,' *Reuters* 12 (15); 'Brazil's Soy Market Sees Seedling Demand for Non-GMOs,' *Dow Jones* 12 (20); 'Brazilian Judge Cracks Down on Illegal GMO Soy Planting,' *Dow Jones* 12 (28);'Ibama Joins Fights Against Transgenic Soy -,' Gazeta Mercantil Online (Brazil) 2 (26); 'Monsanto to Refile Soon for Brazil OK of Soybean Seed,' *Wall Street Journal* 3 (17).

51 'Brazil Court Reaffirms Ban on Biotech Soybean Planting,' *Dow Jones* 8 (16), 19999; 'Monsanto to Appeal Brazilian Ruling,' *Wall Street Journal* 8 (18), 1999; Brazil Court Deals Another Blow to Monsanto on GM,' *Reuters* 6 (29), 29 June 2000.

52 Monsanto's $550m Brazil Roundup Plant Building Starts Friday,' *Dow Jones* 1 (13), January 2000.

53 See 'Greenpeace protest for Argentine GM food labels', *Reuters*, 20 July.

chicken farming. This infuriated chicken farmers, but nevertheless highlighted the growing trade in GM products, and the increasing dependence of Brazil on them. In July 2000 farmers, led by the Landless People's Movement (MST), attacked a ship in Recife containing GM maize from Argentina.[54]

All of these actions resulted in increasing frustration from government authorities. All cabinet ministers signed a note in favour of GM crops in July 2000, and President Cardoso signed a decree empowering CTNBio to authorise GM crops.[55] But this only heightened the determination of the anti-GM activist groups, with blockades and injunctions against shipments (of Argentine GM corn) intensified.[56] With a loosely networked cluster emerging around the campaign for a GM free Brazil (*Campanha Nacional por um Brasil livre de Transgenicos*), the range of groups involved expanded. The MST (the Landless People's Movement) – particularly through its connections with the international peasant farmers' movement, Via Campesina – became increasingly involved, and were able to mobilise farmers in numbers. The World Social Forum in Porto Allegre in January 2001 was an important focus for protest, and continued to be so in the events of 2002 and 2003, attracting many international activists from around the world. In 2001, over a thousand MST workers invaded a Monsanto farm in Rio Grande, destroying five acres of GM soybeans. They were joined by the French farmer activist Jose Bove who was arrested for participating. Anti-GM mobilisation now hit the international press;[57] and attention increased with the ActionAid-facilitated citizens' jury in Fortaleza in April 2001.[58]

By this stage the 'campaign' involved participation from an impressive diversity of organisations and constituencies – consumers (through IDEC), environmentalists (through Greenpeace and ESPLAR, *Centro de Pesquisa e Assessoria*), development actors (through ActionAid Brasil and AS-PTA, *Assessoria e Servicos a Projetos em Agricultura Alternativa*), education groups (FASE, *Federacao dos Orgaos para Asistencia Social e Educational* and INESC, *Instituto de Estudos Socio-Economicos*), farmers' movements (through the MST and affiliates), and political organisations (through the PT). Each was able to focus on different areas of advocacy and action – some more direct and protest-oriented; some focused on practical demonstration of alternatives; some through the courts and the media. Thus the network that emerged around the simple slogan 'GM free Brazil' created a 'discourse coalition' (cf. Hajer 1995) which was able to agitate across a range of different spaces.

During 2002 much hope was invested in the success of the PT in the elections. Many NGOs, activists groups and movement players hitched their aspirations – including what many had understood as a commitment to ban GM in Brazil – on the PT success. But when Lula was elected for the PT in

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54 See 'Brazil turns away GM Argentine corn', *Reuters*, 6 June 2000.

55 'Brazil Govt Fights Back Against Anti-GMO Court Ruling,' *Dow Jones* 10 July 2000.

56 'Brazil's Northeast Unloads GM Corn From Argentina,' *Reuters* 7 (26), 26 July 2000; 'Brazil Seals Port Silos Holding GM Argentine Corn,' *Reuters* 28 April 2003.

57 'Brazil Orders French Activist to Leave,' *Reuters* 29 January, 2001; 'Brazil Police Add to Bove's Radical Status – Anti-Globalisation Activist,' *Financial Times* 31 January 2001. For 2002 WSF see: 'Activists at Brazil Forum Say Traditional Farming Threatened by Intellectual Property Rules,' *Associated Press* 2 February 2002.

58 'We, the Jury, The People Have Their Say at a Rival Debate,' *The Guardian* 18 April, 2001; 'The Seeds of Revolt: Citizens' Jury Delivers 'No' Verdict to GM Crops in Brazil,' *The Guardian* 23 May, 2001; see also Toni and von Braun (2001).

October 2002, the jubilation was short-lived. Even before the new government began, the new Minister of Agriculture, Roberto Rodrigues – and a well-known supporter of agribusiness – spoke out in favour of GM crops.[59]

Alongside the courtroom wrangling and activist protest from 1998 onwards, GM crops were increasingly being planted in southern Brazil, despite the bans, decrees and injunctions.[60] Aspirations for a GM-free soya product were being substantially undermined.[61] In 2003 the Lula government, recognising the crop's existence in large quantities, faced a major dilemma – either continue to uphold the ban and destroy the crop, resulting in major demands for compensation, or allow its sale. In March 2003, the government issued Provisional Measure 113 allowing the marketing of the 2002–03 crop, but also introducing requirements for labelling and segregation of products much criticised by industry spokespersons.[62]

The impasse continued into 2004: supermarket protests continued, high-profile meetings were convened, and invasions of research farms were staged. In this period the governor of Parana, Roberto Requaio, backed the anti-GM campaign,[63] and his state's legislature banned the import, sale and planting of GM in October 2003. This was significant because of the large port facility in the state and the importance of soya bean farming to the state's economy, and became a new focal point for local and international campaign groups.[64] But many conceded that a full ban was looking increasingly unlikely given the less-than-radical complexion of the Lula PT-led government.[65] The large soya bean farmers had moved increasingly to a GM product. A further Presidential decree again allowed the sale of GM soya from the 2003–04 season, despite it still having not been approved for planting.[66] De facto, for large areas of the country, GM soya had become the crop of choice.

A key battle front became the revision of the Biosafety Law. In the assessment of Deputy João Alfredo (PT, Ceará state and coordinator of the Workers' Party Environmental Nucleus): 'It is an issue that is dividing the administration, the Workers' Party, and, most of all, society'.[67] Monsanto launched a

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59 'Brazil's Farms Minister Supports Gene-Modified Crops,' *Financial Times* 17 December 2002; 'Brazil Measure Ignites Congressional GM Soy Debate,' *Forbes* 3 April, 2003.

60 'Smugglers Aim to Circumvent GM Court Ban in Brazil,' *Nature* 25 November 2000; 'GMO Soy Planting in Brazil Said to Be Spreading North,' *Dow Jones* 18 December 2001; 'Brazil May Fine Farmers for Illegal GM Soy,' *Reuters* 17 February 2002.

61 This created much debate within the industry, some advocating maintaining a GM-free niche position, while others arguing that the GM route was inevitable. See e.g. 'Brazil Black Market in GM Soybeans Booming,' *Reuters* 9 August, 2001; 'Bean Stalked: Brazil Is the Only Major World Producer of GM-Free Soya, but for How Long?,' *The Guardian* 5 September 2001; 'Brazilian Government Doesn't Know What to Do With Illegal Soya Crop,' *Agence France Presse* 7 March 2003.

62 'Brazil Labeling Plan for GM Foods Draws Criticism,' *Reuters* 1 April 2003; although this had little impact in practice, see: 'Brazil Soy Sector Ignores Gov't Decree on GM Soy,' *Reuters* 8 May 2003.

63 'Brazilian State Bans GMOs,' News24.com 15 October 2003; 'The Ever More Tangled GM Crop Debate,' Inter Press Service 22 October 2003.

64 'Brazil State Seeks to Overturn Parana GMO Soy Ban,' *Dow Jones* 26 November 2003; 'Brazil Studies Solutions to GMO Soy Export Bottleneck,' *Dow Jones* 1 December 2003.

65 'Brazil's Leader Angers His Old Allies,' *New York Times* 3 (24) 2003.

66 'Brazil Lula Says Legalizing GM Soy Was Best Option,' *Reuters* 8 October 2003; 'Brazil's Lower House Passes GMO Soy Law,' *Dow Jones* 13 November 2003; 'Brazil AgMin Says Banned GM Soy Can Sell Locally,' *Reuters* 3 November 2003.

67 'Brazil: The Transgenics Dilemma,' *Issue* 25 August 2003.

vigorous PR campaign, backed by inputs from the US government. Cinema adverts proclaimed the benefits of GM crops, despite their still being nominally illegal.[68] Monsanto too became increasingly frustrated at the loss of royalty revenues from illegally grown GM soya, and pursued this in the courts and in negotiations with major producers.[69] A key sticking point in discussions on the draft law was the authority of CTNBio, and the place of independent environmental assessments. Although early concessions were won on the draft by the anti-GM lobby,[70] and long delays occurred, the government eventually recognised the full powers of CTNBio to regulate and approve GM crops in Brazil. The bill was finally passed into law in March 2005.[71]

Since then the tide has turned against the anti-GM position. With the legal battle now over, CTNBio moved quickly to approve Monsanto's Bollgard GM cotton, by a vote of eleven to one. Only the representative of the Ministry of Environment voted against the approval. On 22 March CTNBio also approved the import of 370,000 tons of GM corn from Argentina to be used as chicken feed.[72] By the end of March 2005 Monsanto had reached a royalty agreement with Brazilian soy producers, and a concerted attempt was on to eliminate the black market in seed sales, so ensuring Monsanto's market dominance, pending the release of local varieties from the state agricultural research organisation, Embrapa.[73]

In the April 2005 newsletter of GM-Free Brazil, the anti-GM alliance vowed to fight on,[74] but with the soya industry now formally committed to GM, the vision of an alternative global front, with Brazil standing out as GM free in a major commercial crop, was now dead and buried.

2.4 Global connections

A key feature of the campaigns against GM crops in India, South Africa and Brazil has been the global connections that have linked activists and debates. The contentious politics and knowledges at national level have been reflected in global debates about anti-globalisation, food sovereignty, farmers' rights and biodiversity, for example. In the loose networks making up global protesters, the GM issue had become a focus for a whole array of different issue-focused protest against the monopolisation of knowledge and technology ownership through patents and the TRIPS agreement; for trade justice as part of the reform

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68 'Monsanto Invests to Improve GMOs' Image in Brazil,' *Reuters* 8 December 2003; 'Monsanto Takes GM Crusade to Brazil,' *Financial Times* 6 February 2004.

69 'Monsanto Pursues Seed Pirates,' *New York Times* 13 June 2003; 'Brazil court rules in favour or US Monsanto in GM seed royalties case', *Latin American News Digest*, 21 February 2005.

70 'Brazil Biotech Chief Defends GM Crop Safety Role,' *Reuters* 19 May 2003; 'Washington Takes the Battle Over Future for Genetically Modified Crops to Brazil: As Brazil Drafts Legislation on GM Food, the US Is Looking to Influence Opinion,' *Financial Times* 20 June 2003; 'Brazil: Environmentalists Win One on the GMO Front,' *Inter Press Service* 30 October 2003.

71 'Illegal GM soy beans go legit in Brazil', *New Scientist*, 12 March 2005; see commentary in 'GM-Free Brazil', Bulletin 14, 1 April 2005.

72 See: www.ictsd.org/biores/05-04-01/story2.htm

73 See 'Monsanto, Brazilian Soy Growers Sign Royalty Accord', *Reuters*, 29 March 2005; '11 New GM Soy Varieties from Brazil', Checkbiotech.org, 17 March 2005.

74 Since March 2005 various protests have been carried out and a series of court petitions launched against the new Biosafety bill claiming the bill contravenes key elements of the constitution. A case by the solicitor general, for example, was issued in June. Meanwhile the working group aimed at implementing the new law has been under intense scrutiny and subject to much lobbying (see GM-Free Brazil bulletins 14–24 (March–August, 2005), from Ass. de Imprensa da Campanha imprensa@aspta.org.br

(or abolition) of the WTO; against the perceived depredations of multinationals (with Monsanto becoming a global target); or in relation to wider rights-focused campaigns around food, health, and farming. For many, the battle over GM crops was a battle over a much wider agenda, encompassing the big issues of poverty, trade and human rights. This framing of the global debate intensely frustrated industry lobbyists, government regulators and many scientists. They felt activists were conflating issues, smuggling in wider protests – and so politics, values and ethical standpoints – into what they saw as a narrow, technical issue. However, this broadening of the frame was vitally important in national campaigns. While each of those profiled above took very different courses, deploying different strategies and tactics, and involving different actors and networks, all had links to this global domain.

A number of international events over the last decade have been important in bringing activists together and consolidating links and networks across sites. The major anti-globalisation protests at the WTO ministerial in Seattle in 1999 were a key moment, soon followed by the first World Social Forum (WSF) in Porto Allegre, Brazil in 2001. The international peasant farmer movement, Via Campesina held a global gathering in India later that year, with Indian anti-GM activists heavily involved. Since then the WSF in Brazil in 2002, 2003 and 2005 has been an important meeting point, as was the Mumbai WSF in 2004 and the World Summit on Sustainable Development in Johannesburg in 2002.[75]

This globalisation of protest had a number of consequences. It exposed people to a wider network, linking people through the internet, email lists and meetings at forums and workshops. It allowed confirmation and support for positions that were often being fought in an isolated manner back at home. The growth of international anti-GM 'stars' provided a sense of occasion to an otherwise average protest event, garnering publicity and media coverage along the way. Thus the annual WSF events became also opportunities for staged protests – by Jose Bove (from France), Vandana Shiva (from India), Peter Rosset (from the US), Percy Schmeiser (from Canada), and many others. Perhaps no-one typified this move to the global arena more than the late Professor M.D. Nanjundaswamy of the KRRS in India. Through his engagement in the anti-GM campaign – and his links to global farmers' and anti-globalisation movements – he moved from being a local politician and state-level farmer leader to an international figure. He increasingly moved in international activist circles, and was revered as a 'southern' farmer leader, a voice from the poor and marginalised. In an interview he reflected:

> There is no difference between international, domestic and local issues these days. Seeing international contexts is important for local activism. Seeing what happened in Seattle and Prague first hand was significant.[76]

He was also almost continuously in the media spotlight, including the international press, with his well-staged burning of field trial sites, replicating – and indeed encouraging – the protest tactics of Greenpeace, Genetic Snowball and others in Europe. Such events were also often in the presence of international

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75 See Friedberg and Horowitz (2004) for a South African perspective.

76 Interview, M.D. Nanjundaswany, 27 February 2001.

observers and activists, many now familiar names on the anti-GM global circuit. Over this period, the burgeoning internet-based activist networks also propelled KRRS and Nanjundaswamy into the international arena, with his press releases copied to thousands of in-boxes throughout the world.

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So how do we make sense of the anti-GM campaign, both in its national and international contexts? Was this a flash-in-the-pan set of protests, driven by elite groups and financed by dubious (European) interests, as some claim? Or has this period shown the emergence of a type of protest, where relationships between politics (and so values and ethics) and knowledge (and not only mainstream scientific perspectives) are seen in a new light? Has the relationship between science and citizens changed as a result? The following section of this paper attempts to set the GM debate in context, highlighting the 'political opportunity structures' and the 'micro-mobilisation contexts', set within a broader historical examination of 'cycles of contention' (cf. McAdam *et al.* 2003; Tarrow 1998) prevailing both before and during the period of study. This provides the basis for a further comparative unpacking of the nature of anti-GM protests and activism in the three countries.

3 The GM debate in context

The broader social and political field that defines the setting for activist actions and the formation of alliances is critical in understanding what happened during the period under review and why. This requires a longer time-depth in the analysis, and a wider assessment of the political landscape. Again, such an assessment can only be limited, but a few points of similarity and difference between India, South Africa and Brazil are worth noting.

3.1 Democratic and economic transitions

Today, India, South Africa and Brazil pride themselves on being strong, established democracies, pursuing a broadly social democratic project, but one based on 'sound economic principles'. The democratic transition in South Africa is only just over a decade old (1994) and in Brazil not quite double that (1986). Memories of the apartheid regime in South Africa and the dictatorships in Brazil are recent, and the practice and experience of democracy novel and much valued. India is the contrasting example, having established a parliamentary democracy at independence in 1947 which, bar the Emergency period, has remained more-or-less robust since. However, despite this longevity, the threats to democracy – from religious-based extremism for example – are strongly felt. In all three countries it is difficult to escape the feeling – articulated during interviews of government officials, NGO activists and the liberal media alike – that the ability to protest, debate and organise is an important part of what the transition to democracy, whether in 1947, 1986 or 1994, was about (cf. Avritzer 1995; Lodge 2003; Adler and Steinberg 2000).

To varying degrees, all three countries have a federal structure (Heller 2001). India and Brazil are large countries where sub-national states have populations and economies comparable to medium-sized

countries. State-based politics has always been an important part of the picture, with relations between the states (or provinces in South Africa) and the centre being an important dynamic. A uniting factor has been a constitutional umbrella setting out a broad set of rights and responsibilities of citizens, wherever they come from. In South Africa the constitution is held up as an icon of success of the negotiated settlement, and is celebrated as the most comprehensive and radical in the world (Habib and Padayachee 2000). Constitutional challenges to legislation or government action are a key feature of civil society responses in all three countries. An independent judiciary – or at least one where particular judges are seen to be sympathetic to arguments based on wider premises than those forwarded by government – is seen as central to the democratic state.

Democratic practice, however, is highly conditioned by changing economic factors. An understanding of institutions – of law, administration or regulation – cannot be separated from a broader assessment of political economy. The nature of the state has changed dramatically over the last decade in all three countries. From 1991, India began liberalising the economy, dismantling many of the state functions held so dear by the post-independent Nehruvian state. This ushered in a different form of politics, one based on the federal market economy, where what happens at the state level is as important as what happens in the centre. Dictates from the centre – whether in the form of regulations or statutes – have to be implemented to have meaning, and state capacities are increasingly limited (e.g. Weiner 1999; Jenkins 1999; Manor 2001; Rudolph and Rudolph 2001). For example, widespread illegal planting of GM soya (in Brazil) and GM cotton (in India) made a mockery of the central government regulations, resulting in embarrassing about-turns, temporary measures and time-limited decrees by the central state.

With intense competitive pressures in the global economy, getting (usually foreign) investment is perhaps the main focus of policy for all governments, whether at national or sub-national levels. All else pales into insignificance, it seems, with deals, bargains and provisions struck with investors (including major GM companies), which are not necessarily subject to full democratic scrutiny. In the liberalised, globalised economies of the federal systems of India, South Africa and Brazil, the imperatives of the market often supersede those of ordinary citizens;[77] at least until election time. Economic and political transitions are thus ongoing, and in parallel in all three countries. This affects the nature and possibility of democracy and protest, with major implications for what 'spaces' are open or closed, and so the tactics and strategies of activism.

3.2 Political parties and the election cycle

The election cycle has been an important focus for mobilisation activity in all three countries. In all cases, the current governments are coalitions, with a strong dominant party. In India, the 2004 elections saw the return of the Congress Party, together with a broadly left-oriented alliance. In South Africa, the African

[77] See critiques of South Africa's liberalisation policy and its impact on politics and protest by Bond (2000) and Peet (2002). Also see assessments of PT government in Brazil in Baiocchi (2003), Hunter (2003). For India see Scoones (2003b) for an examination of the role of business in the politics of policy around biotechnology in Karnataka state. For a wider treatment see Corbridge and Harriss (2000); Patel and Muller (2004).

National Congress was returned with an enhanced majority in 2004 and continues to lead the tripartite alliance that took over following the fall of apartheid a decade ago. In Brazil, the PT (Workers Party)-led alliance took power in 2003, after removing the Cardoso government at the polls.

As emerging economies with global ambitions, all three countries, despite their more populist rhetoric, cannot shift too far from a pro-business and investment line. This results in some uneasy compromises between nationalist, socialist, or at least social democratic, rhetoric and actual policy and practice. In all three countries the incumbent governments have been strongly criticised for compromising too much with the forces of global capital in their rush to present themselves as viable international investment destinations. Thus in South Africa, the alliance between the ANC and the unions (COSATU) and the South African Communist Party is often fraught. The 'movements' who backed Lula in his bid to become president in Brazil have become increasingly critical of the PT government, with the party losing key seats in the October 2004 municipal polls. Pressure from the MST, for example, on the implementation of the promised agrarian reform policy heightened in 2004–05, with mass invasions of farms restarting. In India, many are perhaps more cynical about the political process. But the unexpected return of Congress at the centre in 2004, did raise the spectre (at least in the media imagination, if not in the precise electoral calculus) of a rural backlash against an arrogant, urban-biased, elite-driven politics. In all three countries, the electoral dynamic is a key factor in shaping mobilisation strategies and state responses, as we will see below.

3.3 Beyond GM: mobilisation issues

In none of the three countries are GM issues anywhere near the top of the political agenda. They have raised their head at various points, attracting media attention and responses from politicians, but more as emblematic issues linked to more central debates. For those in the thick of the GM debate this may be frustrating, and the effort is continuously to push the GM issue up the pecking order.

But this can only be done by making links to other more high-profile issues and concerns. Most rural dwellers – a significant proportion of the electorates in all three countries – do not really have an idea of what GM crops are[78] and are mobilised on other issues – fears about the unknown (terminator crops, Frankenstein foods etc.), concerns about patents, loss of local varieties and so on. Indeed, very often the very same farmers mobilised by organised farmer movements – whether the KRSS in Karnataka or the MST in Brazil – are the same farmers planting pirated GM crops illegally, or would try them out if they could.

However, the discourse on technology changes when linked to broader livelihood concerns; those central to personal and political concerns among farming populations. Thus in Brazil the MST is able to mobilise farmers around the GM issue by linking it the wider question of agrarian reform. The Via Campesina movement, to which the MST is linked, talks of food rights and food sovereignty and the need

[78] At least only in a general sense, and when exposed to activists. For example, a survey in South Africa found that only 1 per cent of South Africans were familiar with the GM issue, *Cape Times*, 3 May 2005.

for peasants to be independent of the clutches of global agribusiness.[79] For the marginalised rural poor in Brazil this chimes well with many of their concerns. Even when they know little about GM crops, seeing Monsanto as the enemy, allied to a Brazilian state reluctant to engage in any meaningful rural reform, produces an appealing storyline to which people have signed up in numbers.

That this connection has failed to emerge in South Africa is perhaps a puzzle. A similarly disenfranchised rural populace with comparable patterns of land inequality has not resulted in a similarly vibrant movement around land reform, rural livelihoods and agricultural technology. Here again, we must reflect on the core issues that do result in mobilisation. In South Africa, where the political movement that became the ruling party emerged from the urban areas and the union movement, rural issues are not prioritised. Land reform, while important as part of government rhetoric, has not been the ANC's major policy priority. No equivalent of the MST has emerged; although the Landless People's Movement models itself on the MST, it has largely failed to generate mobilisation on any scale (Lahiff 2003). The political elite sees large-scale commercial farming – although with transfers to black ownership – as the future for the agricultural sector, with GM crops very much part of the picture. Instead, priorities for activists have centred on issues of urban violence, responses to the HIV/AIDS pandemic and labour conditions – themes around which there has been significant civil society mobilisation in the past decade.[80]

In both Brazil and India, despite the ongoing wrangling over regulations and approvals, many farmers had long started planting illegal GM crops (cf. Herring 2005 for India). This presented a problem for the anti-GM campaigns, focused as they were on the formal process. Mobilising against GM crops thus required linking the GM issue to others. In the campaigns against GM across all three countries, activists have linked GM crops to problems of indebtedness and increasing reliance on credit and loans from traders and seed companies, for example. They have also been linked to a dynamic of commercialisation in the farm economy, with smaller farmers being sidelined in favour of large-scale units and contract farming. The debate has also been linked to the erosion of local varieties and choice for farmers, and especially recycling of seed, and to the wider globalisation debate, the WTO and the removal of quantitative restrictions on imports, and the fear of price collapses for commodities with the flooding of local markets. Yet none of these issues are only about GM crops; they apply just as well to most hybrid varieties, and to wider trends in the agricultural economy, wholly independent of the GM issue. What is highlighted by these linkages and elisions is a wider question about choice, sovereignty and future livelihood options: all far more pertinent and challenging issues for political debate, and more concretely linked to people's tangible concerns.

Thus across the three countries, the GM debate has been characterised by the strategic development of alliances and the linking of actors and organisations in new, often fragile, coalitions. Most of these have focused on rural/agricultural issues which, as we have seen, have variable purchase on the political process. Galvanising urban consumers has been more challenging. In all three countries consumer

79 See www.viacampesina.org; www.mstbrazil.org; Wright and Wolford (2003).
80 See Swilling and Russell (2002); Glazer (1997).

organisations have become involved in the GM debate, taking their lead from their European counterparts in developing awareness about food safety issues; mobilising for food labelling; and consumer boycotts to hold supermarkets to account. But in India, South Africa and Brazil, most consumers do not have the interest or awareness of the discerning European shopper. In all three countries there is a small but influential group of middle-class consumers who are prepared to pay a premium for non-GM food, and will argue for environmentally-friendly, locally-based production systems. However, for most urban – and indeed rural – consumers with low incomes their concern is with prices of commodities, not their origin. Again, concerns about GM crops must be linked to other issues. In South Africa, consumers often raise questions about nutritional quality for AIDS sufferers. Baby food, increasingly purchased from standard retailers, is similarly a concern, where even poorer consumers are keen to ensure the highest quality and take no risks.

Yet, as most consumer activists admit, raising awareness about food issues among consumers is an uphill struggle. With the consolidation of retailing in all three countries (especially Brazil and South Africa) into a select number of supermarket chains, more purchase has been found for middle class, elite anti-GM activists by forcing labelling and in some cases bans.

3.4 Alliances, networks and discourse coalitions

Building alliances and networks to upgrade the priority of the GM issue has perhaps been most successfully developed in Brazil. Here a hugely diverse range of organisations came together under the loose banner of the GM free Brazil campaign.[81] Some of these organisations would not normally been seen together; indeed each had a very different view of the most appropriate and legitimate strategy for opposing GM. But they have largely been able to avoid disagreeing on detailed strategy and tactics, which was left to each organisation to decide, and focus on uniting under a simple banner. The discourse coalition thus formed disagreed on many things but focused only areas of agreement. It was thus fairly fragile and had to be managed with care. The coordinators were well aware of this, and were able to manage the tensions effectively.

A similar pattern is evident in South Africa, although on a smaller scale. Within the broad grouping identifying with the anti-GM campaign, there are those who disagree strongly with direct action tactics, while there are those who feel civil disobedience and a more disruptive stance is probably the only way to go. They are able to work together because the network created is not reliant on a single vision and strategy. Over time it has also evolved from a small group centred on Biowatch and Safeage to a larger range of organisations, many of which do not have anti-GM activism as their sole focus. Most have a broadly environmental focus, others have a practical emphasis on sustainable or organic agriculture; others have a rights/justice orientation; are linked to the labour movement; or are faith based groups (see above).

[81] ActionAid Brasil; Agora; AS-PTA; Centro Ecologico do Ipe; ESPLAR; FASES; Forum Brasileiro de Seguranca; Greenpeace; IBASE; IDEC; INESC; SINPAF; MST.

In India a broadly similar array of organisations are incorporated under the anti-GM umbrella, but there is no sense of a coordinated campaign. Various attempts at coming together on a common front have failed due to differences in views, but particularly personalities. Each of the main groups presenting an anti-GM position over the past decade has strong individuals as leaders. Vandana Shiva is perhaps the most celebrated, heading the RFSTE. Devinder Sharma of the Forum for Biotechnology and Food Security is an equally effective campaigner and media commentator, but with a different style. Suman Sahai, convenor of the Gene Campaign, is different again too, with her emphasis on research and engagement with policy. And, finally, leader of the KRRS faction, the late M.D. Nanjundaswamy was in a league of his own – maverick and astute, a media-savvy publicist. The anti-GM position – and particularly its media representation – has been very much associated with these individuals; their organisations and wider networks have been in the background. Yet in particular places, out of the national spotlight and media game, there are other individuals and groups who operate on a more modest level, without the exposure and without (most of) the personality politics.

In a survey of anti-GM activist organisations in the southern city of Bangalore, I identified over 20 organisations with an explicitly stated anti-GM stance, including of course the KRRS. These again clustered into those working practically in the field through demonstration projects on sustainable and organic agriculture, seed saving and biodiversity (Green Foundation, AME Foundation, Honey Bee Network; Organic Agriculture Network); those with a broader development focus (including the international NGO ActionAid and the local NGO Myrada); those with an explicit rights focus (DISC – emphasising food and worker rights; CREAT – emphasising consumer rights and education); and those with an environment focus (Greenpeace-India; Environment Support Group). There were also other organisations including political parties (notably CPI(M)) and academic networks (e.g. Association of Environmental Economists).

The networked form of the anti-GM campaign is therefore striking in all three countries. Often holding within it complex tensions and difficult personalities, but able to operate in concert at least on occasions. Whether such networks, alliances and coalitions add up to a 'movement' is another question, one I return to at the end of the paper.

3.5 Gaining legitimacy and authority

The legitimacy and authority of these anti-GM networks is a major issue. It is all well and good mobilising a diverse group, creating a coalition around a simple narrative – a GM free Brazil or a freeze in South Africa or a Monsanto Quit India slogan – but how easily dismissed is such a coalition? Does it have any chance of influencing those in power?

In South Africa, the recent history of the anti-apartheid struggle has shaped many organisations, and while people quip about 'struggle credentials', they certainly matter. The labour unions were of course central to the opposition to the apartheid regime, and the key union grouping Cosatu is formally part of the tripartite alliance governing the country. That Cosatu is notionally anti-GM has little impact directly, but that the anti-GM groupings can highlight the commitment of the unions to their cause carries much

weight. However, the most numerous organisations in the network are more conventional green or environmentalist and – perhaps unfairly given the increasing number of blacks involved – are associated with 'white' interests. Some of these are fairly conservative, certainly historically, including the botanical and wildlife societies; others present themselves as radical, but in a 'deep green', rather Eurocentric way. Other organisations though are rather closer to the people. The EJNF, for example, emerged as a support organisation working on environmental issues in the townships in Johannesburg and Cape Town, and enlists volunteers from deprived areas in actions and projects. The churches and mosques also have a distinguished tradition of radical action in the apartheid era, and carry with them much support. Yet the degree to which these organisations can influence events is dependent on strategies and tactics. A leading ANC minister recently dismissed activists as 'irritants'. An irritation they may be, but whether they can make a difference and how is discussed in the next section.

In Brazil, a key stage in the development of the anti-GM network was the enlistment of the MST. Initially sceptical, the advantages soon became apparent to MST leaders. As an increasingly internationalised movement – with websites and support groups in the US and Europe – this was a relatively easy step. Thus with the arrival of activists by the plane load to Porto Allegre for the WSF festivities each year, the MST were able to raise their international (and so local) profile and forge links with the hall of fame of international anti-GM activism. For the small group of NGOs, which to that point were the core network members, this was critical. They could no longer be criticised for just being unrepresentative, unaccountable, foreign-funded NGOs (which they were), but were linked to a mass movement with official and informal connections to the PT, allowing political clout well beyond what was possible before. Whether this argument for legitimacy and authority stands up to scrutiny is an open question, though one which at least in public discourse can largely be brushed aside, such is the romantic appeal of the 'movements' in the political imagination and history of struggle against dictatorship in Brazil. It is the symbolic importance of the alliance which gives the stamp of approval in the eyes of many.

Something similar applies in India. Here too, the history of the social movements has been very significant – in struggles against rural oppression, around the time of the 'Emergency' and in day-to-day involvement in rights issues at local levels (Ray and Katzenstein 2005; Yasin and Dasgupta 2003; Katzenstein *et al.* 2001; Omvedt 1993; Lindberg 1997). Again there is a level of romanticisation that does not stand up to close scrutiny, but the movements' symbolic importance is key. Thus the KRSS is essentially a collection of relatively elite farmers from Karnataka interested in pushing their claims for farm subsidies (especially cheap electricity and water for irrigation) and price control (for both inputs and outputs). Knowing the importance of rural vote blocs, the state government must take them seriously. Most KRSS activity has been focused on pushing for these sectional interests and not engaging in wider campaigns about corporatisation of India, anti-globalisation, WTO and patents or GM crops (Assadi 2002; Featherstone 2003). These have been add-on concerns, largely at the instigation of the charismatic and persuasive M.D. Nanjundaswamy. That large numbers of farmers turned out to support the demonstrations and actions is witness to the importance of the organisation as an effective lobbyist on other issues, rather than a genuine commitment to getting rid of GM crops per se. But the symbolic

association with a 'legitimate', mass-based farmers' organisation has been important for many other organisations linked to the anti-GM network. As small NGOs without mass membership they must make a case for their speaking on behalf of farmers and the rural poor. Sometimes they do this modestly, speaking as intermediaries with experience of particular people and areas as a result of their ongoing field engagements through projects.[82] Sometimes links are made to wider fields of mobilisation, for instance around food rights which has managed to mobilise people from diverse walks of life.[83] Sometimes somewhat extravagant claims are made that, because of links to particular groups, the NGO does speak on behalf of large categories of people (the poor, women, tribals and so on).[84]

3.6 Activist trajectories

The above sections have mentioned a huge array of organisations; each of these – and the individuals that make them up – have particular histories and different trajectories. A definitive statement about their social make-up and personal trajectories would require a more in-depth survey and a more rigorous classification. However, a number of patterns can be discerned from the available data.

As discussed earlier, virtually all leading activists in all three countries are well-educated, at least to degree level, and a large number have doctorates. Many were originally trained as scientists, often biologists/geneticists with hands-on lab experience. They are almost all urban-based and relatively well-off by the standards of the country as a whole. As founders or key players in organisations they are well connected to the funding world, often linked to a variety of international aid donors (HIVOS, ActionAid, Ford Foundation were among the most often mentioned).

They all have had past experiences in activist/political arenas – in Brazil in struggles against the dictatorship in the 1970s and 1980s, and for Lula's election in 2002–03; in India in farmers', womens' and environmental movements (the classic new social movements) of the 1970s and 1980s, and more broadly in anti-globalisation efforts in recent times; and in South Africa in the struggle against apartheid, including union organisation and consumer boycotts. Some have had (unsuccessful) forays into the formal electoral process themselves. What they all understand in great detail is the inner workings of the political process, and the functioning of the state bureaucracy.

The key figures in the core organisations are also all very well-travelled: they regularly speak at international meetings; they attend and are key speakers at the World Social Forum and other similar events; they receive and contribute to magazines, newsletters, and e-lists produced by the main anti-GM groups globally; they are connected by email/internet links to groups around the world; and they are often obsessive electronic communicators themselves. During interviews for this research it emerged that many individuals either know or know of each other.

Thus, in terms of personal trajectories over the past decade, the move has certainly been towards a form of global engagement. But the tensions this produces have also been evident. As the final part of this

82 For example the NGOs Green Foundation and AME.
83 For example the national Food Rights campaign.
84 For example Vandana Shiva's organisation, RSFTE.

paper discusses in more depth, connecting to transnational networks does not mean that the local dynamics go away. Indeed, there is a mutual shaping of local and global, whereby the process is not only 'globalisation from below' (with a vision of many smaller local actors joining in transnational solidarity around an issue pushing new forms of collective action), but also 'localisation from above', whereby the often very narrow, rather parochial local concerns, shaped by international (read often northern, but not exclusively) engagements, are transferred to different locales through transnational networks and linkages.

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This section has shown how the broader political-economic context for anti-GM mobilisation fundamentally shapes opportunities, tactics and strategies, whether through the structure and imperatives of the economy; the history, memory and experiences of earlier struggles for democracy and freedom; the patterns of the electoral cycle; or the political alliances between groups on other issues. These contexts in turn affect the form of alliances and networks that have formed around the anti-GM issue, as well as the motivations, experiences and aptitudes of the activists involved. Networks of ideas, perspectives and knowledges thus link with networks of people and organisations, creating a diffuse, sometimes rather tentative, and often ambiguous form of 'movement'. Given this context, then, how have anti-GM activists engaged, across the different 'spaces' of engagement available to them, and what have been the emergent relationships between science, knowledge, politics and values across these? This is the subject of the next section.

4 Spaces for mobilisation

This section explores the seven 'spaces' for mobilisation introduced earlier, assessing how mobilisation occurs in practice, and exploring the relationships between contentious knowledges and politics.

4.1 Formal, invited spaces

When GM crops first became an option with the advent of *Bt* and round-up ready crops in the mid-1990s, debates about transgenics were confined to the science community. Many thought that the new genetics could be simply dealt with by an extension of regulations applied to chemicals, combined with some element of environmental assessment. Government officials went to work on new regulatory frameworks. They consulted among the science community – largely geneticists and molecular biologists – and set up regulatory bodies to oversee the new genetics revolution. It all seemed so easy. But this did not last. As the new regulations were tabled and the new institutions to oversee them were set up, the debate about GM crops entered a new phase. No longer was it possible to do everything behind closed doors with a small group of invited experts. As an India regulator noted:

> Always when you bring in new regulations, there are disagreements and compromises. Amendments are always necessary. It helps if there is an international consensus. But this was absent with biotechnology. The process of consultation is very painful. There are too many people with ideas.

> Ours is a huge democracy. The problem today is that legislation is much bulkier. People want everything written down. Before people were happy with flexible guidelines. But with public interest litigation around the corner, we have to be secure.[85]

With the raising of the wider debate, there came the need to consult. Consultation has taken a variety of forms. In the early days it was felt that the brouhaha over GM would die out, that the European 'hysteria' would blow over, and all that was needed was some public education, with some scientists assuring people that all was well. Some consultations in all three countries took this form. They were often highly simplistic, and seen by activists and others as condescending and inappropriate. For example, in India the Department of Biotechnology initiated a 'road show' where key speakers would regale the audience with the benefits of GM. By all accounts critical questions were given short shrift. In South Africa AfricaBio took on this role, while in Brazil both CTNBio and EMBRAPA, the government agricultural agency, created similar spaces for consultation. That these were not really consultations in any meaningful sense was evident to all. Debates about knowledge and framing were simply off the agenda, and participants felt undermined by the assumption that the public needed to be 'educated' in proper science.

Following these earlier failures, and as it became increasingly clear that there was a real debate going on, there were other attempts to engage the different parties. In South Africa, both pro- and anti-groupings hosted a variety of set-piece debates. These at least raised the tempo and allowed different protagonists the opportunity to speak. But as both 'sides' reflected, most were rather formulaic, everyone keeping closely to their script. Since it was always the 'usual suspects' who spoke, the opportunities for wider deliberation of alternative knowledges and perspectives was never there.

In the past few years, these forms of engagement have declined in favour of more carefully controlled processes, where convenors set the terms of the invited space. As several leading activists commented: 'What is the point in continuing to debate, when there is no debate?' Those from pro-GM groups and industry concurred.

Thus parallel exercises emerged. In India, for example, the set-piece 'tribunals' organised by RFSTE[86] occurred alongside Monsanto-led events. Very few have seen any real debate. Everyone is seen to have a position, and so the invitation is loaded. In recent years in India perhaps only events hosted by Gene Campaign and the MS Swaminathan Research Foundation have any reputation of 'neutrality'. But even these are prone to suspicion. For example the major Delhi conference organised by the Gene Campaign in 2003 was disrupted by farmers bussed in by pro-GM groups, using the same tactics employed by anti-GM activists on various occasions.[87]

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85 Interview with Ministry of Environment and Forests official, New Delhi, 29 March 2001.

86 See www.vshiva.net/archives/campaigns/. Also see 'Moratorium on farmer genetic engineering sought', *Times of India*, 27 September 2000; 'MNC seed interest vs farmers' plight', *Business Line*, 26 September 2000; 'Debt spells doom for farmers', *Deccan Chronicle*, 25 September 2000.

87 See genecampaign.org press release. See also 'Monsanto's claims are uninformed', opinion piece by Suman Suhai in *Times of India*, 12 March 2003; www.agbioindia.org Bulletin news piece, 17 April 2003.

In any of these invited spaces, demonstrating legitimate knowledge and expertise is critical. Thus using the harrowing individual testimonies of debt stricken farmers from Andhra Pradesh (many of whom had sold body organs to gain income) provided powerful evidence that something is wrong with the rural economy and agriculture at the RFSTE seed tribunals in Bangalore.[88] External expertise is also important, with the big hitters of the anti-GM circuit from around the world often invited to such events.

Evidence thus takes different forms. Personalised verbal testimonies and video shorts with farmer interviews and field surveys provide (inevitably selective) snippets of real-life experiences. They show real people from real places. These may be dramatised further to push the point home – in the form of theatre or video films. While dismissible as simple anecdotalism such methods carry more power than this implies. They potentially add up to a substantial narrative. With dozens of reports from dozens of places, what difference does this have to a standard sample survey, some would ask. By presenting information in the words of people (often portrayed as victims and sufferers) they may have a much more substantial impact than bland, impersonal survey statistics and tables. Presenting information in an appealing form can be done with a fancy PowerPoint, a well-made video or a well-acted drama piece. With an eye to multiple audiences the activist groups in all three countries have led the way in presenting information in their invited spaces in multiple ways – including in PowerPoint mode. The advantages of diversity have been learned somewhat later by the pro-GM advocates, with farmer testimonies and videos now becoming part of their routine too.

In both India and Brazil experiments with citizens' juries have occurred. Initially facilitated and funded by ActionAid, they have drawn on a jury format which had some success in Europe, adapted to local settings (Wakeford 2002). These are interesting cases as there is a degree of formality in the process. Juries are constituted through a selection process involving a cross-section (randomly or purposively) of the wider citizenry, who in some senses become representatives of the wider community. Expertise is used in the form of witnesses who are called to be cross-examined by citizens. While the format potentially reverses the relations of power and control of the expert led consultations, with citizens calling the shots and asking the question, there remains an underlying assumption that expertise is what is needed to resolve the problem or question posed by the jury. A resolution of this is sought through a process of rationalistic deliberation, where – following the jury model – the group is tasked with coming up with a consensus decision. This is not the place to go into the methodological issues arising, as these are many (see Scoones and Thompson 2003), but one characteristic of the juries held in India and Brazil[89] is that these remained closely managed, invited spaces. That the final judgement was against GM was not a surprise to anyone. This provided an ideal media opportunity. These 'judgements' were carried in both local and international media. But in focusing on the final outcome, the details of the debate, the dissent, discussion and divisions did not come through, at least in the final reports and presentations.

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88 'Asian seed meet opens today amid controversy', *Times of India*, 26 September 2000; 'Tribunal on corporate control over seeds', *Deccan Herald*, 25 September 2000.

89 For India see: ActionAid (2000); Pimbert and Wakeford (2002) and various press commentaries, including 'Naidu's UK-aided plan is vision of confusion', *Times of India*, 21 July 2002. For Brazil see: Toni and von Braun (2001).

Given the polarised nature of the debate – and the unwillingness to give an inch by each side – perhaps this is not surprising. But what is evident from an assessment of invited spaces created by both the pro and anti camps is that perspectives on GM crops are inevitably partial. They are always biased by who speaks and their location, experience and history. Such perspectives are inevitably based on wider assumptions and worldviews which are often highly specific and personal. Invitations into such spaces have by-and-large been highly selective and controlled. The result has been the closing down of debate (cf. Stirling 2005), the silencing of different voices and the avoidance of deliberation. The way knowledge is legitimised in such spaces is highly dependent on the enlisting of the right actor networks, including the media (see below). But the networks linked to the different camps are almost mutually exclusive, with vanishingly few neutral brokers able to engage with different perspectives on both sides (or change the frame of the debate so that such polarities do not emerge). People are dug in: they have their views, and these are not going to change. The aim is thus one of advocacy rather than debate or deliberation. The focus is on enrolment, enlistment, and carving out a position; the impact of which is felt in other spaces.

4.2 Informal lobbying and networking

Given the apparent inability to find enough common ground, at least in public, much of the debate about GM crops must take place informally, behind-the-scenes. A key facet of the informal lobbying and networking is how government – and particularly the regulatory authorities – are incorporated. Formally, they are independent, impartial and reliant only on 'sound science' judgements from experts to make their decisions. But, since the science on which such regulatory judgements must be made is so contested, other processes must intervene to push the regulatory decisions one way or another. In all three countries regulatory committees – made up in large part of university/institute scientists, government officials and industry reps (with in each case now one or two hand picked non-government reps to demonstrate 'balance') – are very much in favour of GM crops. As one Indian scientist and regulatory committee member put it: 'There is no conflict of interest. I am an authority on the subject; that's what matters'. Another on the same committee observed: 'The regulatory system is dominated by informed scientists. This is a good thing'. Another science advisor noted: 'I go to the advisory group meetings of the DBT. Everyone has the same view as me. Agreeing is easy'.[90]

The pro-GM lobby groups from industry ensure that this position is reinforced. While there is no formal evidence of direct manipulation of regulatory outcomes, Monsanto, for example, is not averse to sponsoring educational trips to the US, organised by the local US embassy, where the benefits of GM are exposed. Officials, scientists and media persons from all three countries have been on such trips. Monsanto and US government pressure on the debate about the revised Brazilian law on Biosecurity was, as mentioned above, intense. But these PR gambits and free overseas trips do not necessarily impress

[90] Interviews, Bangalore, 10 April 2001; 18 January 2001; 8 February 2001 at IISc, NCBS.

everyone. Those who I spoke to in India, for example, were universally cynical – happy to make use of the hospitality, per diems and the opportunity to see St Louis and Washington DC, but not prepared to buy the story hook, line and sinker.

Within the official regulatory authorities, there are, not surprisingly, divisions of opinion and perspective too. These are accentuated by rivalries between ministries, between individuals and between public and private sector reps. These divisions can become the focus for activist attention. Not having direct access to the regulatory system (except in a few cases), they must influence the process by stealth: careful lobbying based on an astute understanding of who is who and what arguments may sway them. In the past, this approach has been blunt and ineffective, but increasingly the anti-GM lobbying has become more sophisticated, as understanding of the policy process has improved. For example in India, activists have played off the central Department of Biotechnology, the Ministry of Environment and Forests, and the Ministry of Health. And, within agriculture, the Ministry of Agriculture of the Union government and some state government departments have been at loggerheads, as have private sector interests and government-funded researchers. With access to the right people, activists have thus influenced the process by careful briefing and exposure.

4.3 Party political and electoral processes

A key element of lobbying beyond the bureaucracy is to ensure that elected politicians are on board. If key elected figures back a position, they can call the shots, even in the face of reluctant civil servants. As we have seen, tactics in Brazil have been very much hooked into electoral politics and the importance of state-level support for an anti-GM stance. Thus at different times the governors of Parana and Rio Grande do Sul have come out as against GM crops, going as far as proclaiming their states GM-free zones. Despite the impracticality of such a position, the statements are important signifiers. As populist moves, with few consequences, they make good political sense. They demonstrate the independence of a state governor in the face of federal control; they show that the governor is listening to the people and the movements; and standing up to 'bad' multinationals always goes down well, especially if other issues are not looking too hot politically. While not all such moves are done purely out of cynical motives, the political rationale certainly counts, even if the individuals concerned believe that banning GM crops is a good thing to do.

In Brazil the close involvement of movement actors in the Workers' Party (PT) campaign for the national presidency meant that activists had a strong sense (if not actually a firm commitment) that a Lula-led government would institute a ban on GM crops. That this did not happen was, as discussed above, a major disappointment. But divisions within the Lula government have been exploited, notably between Marina da Siva, the Minister for Environment (and former rubber tapper activist) and the minister for Agriculture, Roberto Rodrigues (from an agribusiness background). That Rodrigues appears to have had the upper hand – given the strong backing from agribusiness to the government – has explained many of the outcomes to date. But lobbying deputies and senators during the passage of legislation nevertheless does have influence. A number of successes can be counted, including the repeal of the four per cent GM

content labelling, and the commitment to a one per cent cut off. During the passage of the Biosecurity law, MST activists camped outside the parliament in Brasilia for months, providing a continuous presence outside while discussions were going on inside.

In South Africa, the focus has been on influencing the parliamentary portfolio committees on Environment and Agriculture and Land Affairs. These are cross-party standing committees that review legislation as it is going through parliament. The chairs of these committees can be hugely influential, and gaining their ear is an important channel to influence. In South Africa, given its constitutional commitment to open forms of democracy, these spaces are relatively easy to access: any citizen can present arguments to the committee as evidence. But gaining influence is another matter which requires more astute lobbying. Again, political and personal differences are researched and exploited; personal connections are capitalised upon; and briefings seed key arguments. Access to the space may be open to all, but political connections matter for gaining access to the process. Given poor political connections to the governing clique of the ANC, the anti-GM activist organisations have had to worked at this. For example, the Cape Town based NGO, Environmental Monitoring Group, took the whole Agriculture and Land Affairs portfolio committee on a field trip to a 'sustainable agriculture' project in the northern Cape, as part of an attempt to demonstrate that there are viable small-scale agricultural alternatives in the country.

However, it is not just the evidence and the arguments that matter, but the political credibility of the sources. While on face value local South Africa activists should fit the bill better than a foreign multinational such as Monsanto, in some elite ANC circles, where the mantra of foreign investment is all, this is not always the case. Activists therefore have to work harder to make their case, and convince ruling politicians – essentially the ANC – that it makes sense to back an anti-GM line. This is an uphill struggle given the paucity of political debate about rural and agricultural issues in South Africa. The very few statements on GM issues from ANC politicians of any sort are largely fence-sitting.[91]

At federal level in India, GM issues have been the subject of a few questions in the Lok Sabha, but have not captured the political imagination. The wider question of rural deprivation and poverty, the rash of farmer suicides and the consequences of full WTO conditions, however, does animate politicians. But the debate, as elsewhere, is by-and-large not very sophisticated. The mix of nationalist posturing, pro-farmer rhetoric and anti-multinational polemic is well-used in these spaces, and is encouraged and fuelled by the activist networks. But things do not go much further than this. As a state responsibility, most of the action happens at more local levels. State ministers, for instance, halted the *Bt* cotton trial programmes in the states of Karnataka and Andhra Pradesh in 1998–99 when activists had mobilised to stop the process. Again in 2002 the Karnataka state minister of agriculture 'banned' *Bt* cotton from the state, even after

[91] For example, an article by the chair of the Agriculture and Land affairs portfolio committee, Neo Masithela, 'The regulation of genetically modified organisms in South Africa', www.anc.org.za/ancdocs/pubs/umrabulo18/gmo.html, 18 June 2003; see also; 'Need for a constructive debate on GM food', *ANC Today*, 3(25), 27 June 2003.

central approval for commercial release, allowing only 'supervised planting'.[92] Given that there were already huge areas already planted illegally with pirated varieties, and that supervision across thousands of hectares was absurd, this was a populist gesture, an attempt to pacify the assembled masses of KRSS supporters protesting outside the Monsanto Research HQ in Bangalore.

Beyond eliciting populist responses of this sort, activists have made little headway with Indian politicians. There is to some degree a mutual contempt. Politicians regard activists as trouble-makers, operating outside formal procedures and sometimes outside the law. Many activists see politicians as corrupt, ill-informed and of little worth. These assumptions do not lend themselves to productive dialogue. Indeed much state politics in India carries on outside the legislatures. A new form of elite politics has emerged in some parts of the country – notably in the hi-tech, investment destination states in the south – where committees of business, science and government officials meet to design policy, largely outside the scrutiny of the political process. Thus, for example, in Karnataka, the state's biotechnology policy was prepared by a small, selective task force handpicked by the Chief Minister. This was a highly closed space, even excluding large swathes of the state government and science establishment. This policy backed GM crops in the state, and was framed in a very specific way, linking a new biotech revolution to the successes of IT in the state, excluding all other perspectives at a stroke (Scoones 2003a,b, 2005).

Thus knowledges are co-constructed with politics: sometimes activists gain access to political spaces, when the party political and electoral dynamics work in their favour, but often they are excluded. Framing knowledge in order to gain access is a key skill, but one that is not always available. As new networks emerge that are exclusionary and restrictive, then such political spaces are closed down, requiring activists to seek out alternative spaces in their strategies for mobilisation.

4.4 The legal process and the courts

If the political process is prone to exclusion, fickleness and often ultimate disappointment, then another route available in all three countries is an independent court system. With regulatory legislation – pending and approved – governing the commercialisation of GM crops, there are plenty of opportunities for activists to insist that appropriate procedures are followed. In addition, all three countries have strong constitutions which enshrine a series of rights, including, importantly, freedom of information. These rights are upheld by constitutional or supreme courts which can hear cases submitted by plaintiffs from any quarter. Both these channels – procedural compliance to statutory regulation and constitutional/rights-based challenges – have been an important part of GM activism, and so the deployment of knowledge, in all three countries.

A legal route to accountability for many is more reliable and consistent than a political one. Raising issues in the courts can be an important route to heightening political – and media – awareness of an issue, and galvanising politicians into action. Most questions raised by elected politicians in national and

[92] 'Monsanto told to stop field trials', *Indian Express*, 3 December 1998; 'Seeds of controversy', *Times of India*, 4 December 1998.

state legislatures have emerged from court cases, for example. Independent court systems in all three countries are symbols of democratic institutions. The independence of the judiciary is closely guarded, and judges, lawyers and courts – unlike politicians – are more, though far from universally, trusted.

The ability to pursue public interest litigation in India, for example, is seen by many as critical to a functioning democracy. That it is cheap and relatively easy to make a submission, and that the court is obliged to hear it (even if the plea is rejected) is seen as part of basic democratic rights. A day in court – or even an hour – is an opportunity to raise awareness, attract media attention, call witnesses, and to lay out arguments in public – and hopefully get a favourable judgement, carrying with it legal authority and gravitas not available to the average anti-GM activist. In India many such cases have been submitted – demanding the release of information on trial data; full environmental assessments; the appropriate sequencing of regulatory testing; and compensation for failed crops.[93] However, such legal processes have become intensely used of late, and their impact has perhaps diminished. Cases are heard late, and the media increasingly do not find yet another NGO public interest case newsworthy.

In Brazil the courts have been used very successfully, formally banning the planting of GM crops until 2005. Activists argue that the ability to take the government to court has been an important route to holding the state – and so corporations – to account. In the GM case, this has allowed the consumer group, IDEC, together with Greenpeace, to argue that GM crops should not be planted unless a full environmental assessment is undertaken in accordance with existing environmental law. Although presidential decrees allowed the sale of GM soya planted illegally for several years, the original provisional judgement remained, pending a full decision of a bench of judges which finally proclaimed only in 2005. This process of procedural delay, even though ultimately unsuccessful, allowed the issue to remain in the public – and political – eye, and the elaborate legal procedures played into the hands of the activist groups. It also meant that different sides could lean on the respective judges, persuading them to adjudicate in one way or the other. As commentators put it: 'we know xx is pro, and is in the pocket of the government, so we have invested effort in lobbying yy'. Thus extra-court processes of lobbying, media campaigning and presentation of evidence become important in long, protracted court battles.

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93 For example, RFSTE submitted evidence to the Supreme Court on the basis of their own survey in 1998. See 'Monsanto trials illegal, says environmentalist', *Times of India*, 21 December 1998. The public interest petition sought judicial intervention to check alleged violation of the regulations, and the Supreme Court issued notices to federal ministries of science and technology, agriculture and environment and forests in February 1999. The Supreme Court rejected Monsanto's plea for the dismissal of the litigation, and the case was heard on a number of occasions (see *Economic Times*, 19 November 2000). RFSTE have claimed the 2002 decision to allow commercialisation as illegal as the PIL was still pending. Gene Campaign also filed a public interest litigation petition with the Supreme Court in January 2004 arguing that the regulations be amended to comply with constitutional rights. The petition argued for the establishment of a high-powered committee to formulate a new national policy based on a stakeholder consultation process (see http://indiatogether.org/2004/jan/env-gmsyspil.htm; www.genecampaign.org). In addition to Supreme Court petitions, an increasing number of other PIL cases have been submitted to state level High Courts. For example, Kishore Tewari, president of the Vidarbha Jan Andolan Samiti (People's Movement of Vidharba) referring to the non-performance of *Bt* cotton announced 'we have served legal notice to MoA, and if the government does not take cognizance of it, we plan to file a public interest litigation in the Mumbai High Court demanding compensation of Rs 500 crore' (IPS Press Release, 6 September 2002). While many such submissions are thrown out once the hearing comes up, the opportunity of a press release on filing such a case is not missed.

In addition to often being long, drawn-out affairs, challenges to statutory procedures are highly technical and narrowly focused, requiring presentation of evidence in the terms of the relevant statute, directive or regulation. This limits the discussion to the minutiae of the legislation. For many activists this misses the point. The issues are not whether a trial took place with the wrong spacing and at an inappropriate time, but whether trials should take place at all. Court cases of this sort are also expensive and time consuming. They require the employment of lawyers to prepare the case, and the detailing of extensive amounts of information to be submitted to the court. While available to anyone – and relatively cheap to initiate – these spaces are not free of costs. Indeed, they may debilitate small activist organisation for months, even years, sucking up valuable resources and time, and drawing people away from other – perhaps ultimately more productive – tasks.

This tension has been a major discussion, for example, in Biowatch in South Africa. Perhaps unlike in India and Brazil where there are either multiple players or clear divisions of responsibilities, there are fewer players in South Africa able to cover the ground. The decision to engage in a court action against the South African government's National Department of Agriculture (later joined by Monsanto as co-defendant) has been controversial. The case was taken on by a committed environmental lawyer, but required the few Biowatch staff to invest considerable effort in providing materials. While, at their admission, this forced them to look at the evidence they really had – rather than what they thought they had – it was nevertheless on a narrow procedural issue. As one staff member observed: 'lawyers distort the process. They are only interested in certain things. You can easily end up losing the plot'.[94] With the resolution of the case in Biowatch's favour this small organisation may yet be crippled by being ordered to pay Monsanto's legal costs.[95]

Court cases by-and-large are not places where new perspectives, alternative visions and fundamental challenges to underlying premises are presented. This must occur in other spaces. However, in all three countries, the GM debate has also been presented in legal spaces which do allow a wider discussion in the context of constitutional challenges. Court cases heard in constitutional or supreme courts allow a wider framing of the debate, and the introduction of wider perspectives and knowledge, by linking the more technical/procedural questions surrounding regulations to the rights that a citizen has in a constitutional democracy. This allows questions such as food rights and sovereignty, indigenous or gender rights, or rights to information access to be put on the agenda. Unlike other cases, which focus on technical evidence and scientific data, such cases can draw on other sources. This allows activist organisations to expand the scope of their cases, deploying different types of knowledge and new forms of argumentation, developed through their own research activities.

94 Interview, Biowatch, Cape Town, March 2004.

95 Court orders government to lift veil on GMO decisions, 24 February 2005, www.biowatch.org.sa

4.5 Research, practice and demonstration

Generating knowledge and presenting evidence is seen very much as a key role for activist organisations, and not only in court cases. But the relationship between advocacy and research is often an uneasy one, as many informants acknowledged. A staff member from Biowatch in South Africa frankly admitted that: 'in the early years the data from our research was not good enough. We could not make the arguments'. In part this was a matter of resources. As they went on to observe: 'Monsanto can produce data for any occasion. They can get university researchers from anywhere in the world to come and do work….'. But it is also confidence and skills. Although the team included highly qualified people, their forte was not necessarily social and economic survey skills. Reflecting on this experience, they argued that: 'we should have emphasised qualitative, case study research at the beginning: collecting stories, and telling them clearly'.[96]

Research is of course about just this: developing the narrative, supplying the evidence and telling the story convincingly so that, in the terminology of Bruno Latour (1987), 'actor networks' are enrolled. In the argument about whether GM crops have been a success or not, there have been numerous competing attempts to spin different stories and enrol actors into a line committed to or rejecting of GM crops. These attempts often have used the same data, or are at least based on the same case studies. Some have been published in international refereed journals, supposedly conferring on them legitimacy and authority; others have been produced informally as research reports and internet submissions; others have been transferred by word-of-mouth or as part of video testimonies and case studies.

In India for example, following the formal release of *Bt* cotton in 2002, the competition between interpretations has been intense.[97] Literally dozens of 'surveys' have been carried out, each proclaiming a result.[98] There have been many claims and counter-claims, and a certain amount of back-tracking by the pro-*Bt* cotton advocates as the results of the first year's crop proved less positive than hoped for. A huge row broke out following the publication of an article in *Science*, also reported in *Nature*, in February 2003

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96 Interview, Cape Town, March 2004.

97 Elements of this section are taken from Scoones (2005: Chapter 7) and Scoones (2003a).

98 For example, in Andhra Pradesh a DDS-organised survey in 11 villages in Warangal was released by P.V. Sateesh (*Business Line*, 9 December 2002). Press reports in AP also reported poor performance, see for example: '*Bt* cotton dashes hopes of ryots', *Hindu*, 29 December 2002. In Maharashtra a team led by Dr R.B. Thakare editor of Farmers' Forum reported low yields (*AgBioIndia*, 10 December 2002). Similarly in Madhya Pradesh, extensive spraying against sucking pests was reportedly required (*AgBioIndia*, 10 December 2002). Yet, in often the same places, more positive results were reported following the first pickings, with farmers reporting for example a 20–30 per cent yield increase in parts of AP (*Indian Express*, 12, 14 November 2002), and good results in Karnataka (C.K. Rao on www.bio-scope.org, 14 November 2002). The Environment Minister, Baalu reported to the Rajya Sabha in December that the yields were satisfactory (see *Times of India*, 14 December 2002). Earlier in the season problems with leaf curl virus in north India, wilting and root rot in Maharashstra were reported and widely circulated in the anti-GM internet lists (see e.g. *Business Line*, 19 August 2002). By early 2003, MMB were claiming great successes. See, for example: 'Sweet harvest of *Bt* cotton, says firm', *Times of India*, 21 January 2003. However, reports from state departments of agriculture were more circumspect. The Indian Seed Industry Association president, Prabhakar Rao argued that the results were 'not up to the mark', in part because the *Bt* gene had been inserted into an inappropriate variety (see *UNI*, 18 December 2002; *Hindu*, 18 December 2002). Greenpeace in turn claimed that '*Bt* cotton a 95 per cent failure' (*AgBioIndia*, 5 March 2003). There is little doubt that the 2004–05 season will produce similar controversy, despite hopes by government and the industry that *Bt* cotton will boost production (see 'Cotton production to go up 20 per cent on good monsoon', *Financial Express*, 21 November 2004).

(Qaim and Zilberman 2003) which used a series of extremely dubious extrapolations to claim that *Bt* cotton could offer an 80 per cent economic advantage over non-*Bt*. When Monsanto in their more generous PR gambits were only suggesting the gain might be 20–30 per cent,[99] this seemed to stretch credibility a bit too far. An Indian Syngenta employee then based in Switzerland, Shantu Shantaram, argued that poorly peer reviewed articles of this sort in publications like *Science* only undermine the case for crop biotechnology: 'It is unfortunate', he said, 'that both *Science* and *Nature* are making very serious errors in judgement in this most controversial of all technologies by hastily publishing such premature manuscripts based on seemingly not so rigorous data. By doing so, these journals are doing a great disservice to science and technology development'.[100] Others argued that, given the controversy: 'there is no such thing as an independent review in India. Anyone can manipulate the data'.[101] The 2003–04 season produced a similar set of claims and counter-claims, this time in the context of a good monsoon and variable but not severe bollworm attack, where all cotton varieties performed reasonably well.[102] The controversy thus remains far from resolved, centred on contests over knowledge claims, with different 'truths' presented dependent on the type of season, the population dynamics of pest populations and the agro-ecological conditions in any area.

Although on a smaller scale, similar disputes over data and interpretation have been evident in South Africa (particularly around the now famous Makhatini flats *Bt* cotton farmers[103] and Brazil.[104] Resolving the issue through surveys clearly is insufficient – the data are too context specific, and inevitably open to dispute. While some cases demonstrate beyond doubt one position or the other, questions can still be raised: what about the next or previous season? What about farmers not included in the sample? What if company support had not been present?

There are also other ways of generating evidence and telling a story beyond the survey. These approaches draw, implictly or explicitly, on different research traditions of qualitative enquiry and action research, producing case studies and biographies whether in written or video formats. With increasing acceptance of indigenous knowledge and a call to incorporate 'the voices of the poor' (cf. Narayan *et al.* 2000) in policy-making, such approaches carry increasing legitimacy, even if not in mainstream academic circles. This is of course recognised by both those arguing pro- and anti-GM lines, and favoured farmers traipse around the world on both GM and anti-GM tickets.[105]

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99 See Manjunath quoted by *Financial Express*, 23 June 2002.

100 See postings on AgBioview, 21 February 2003 (special: *Bt* cotton in India: how successful is it?), and *AgBioIndia*, 26 February 2003. See extended discussion of the article by Devinder Sharma, AgBioIndia 14 February 2003 'A scientific fairytale: providing a cover-up to the *Bt* cotton fiasco in India', and Arunachalam (2004).

101 Interview, Chair Foundation for Biotechnology Awareness and Education, India, February 2003.

102 See '*Bt* cotton helps boost India's cotton output to record level', *New Kerala*, 5 November 2004.

103 See Thirtle *et al.* (2003), Kirsten and Gouse (2002), deGrassi (2003); Biowatch (2004).

104 See von der Weid and Tardin (2001).

105 For example, T.M. Buthelezi from Kwazulu Natal has been on tours to Europe and the US as a host of Monsanto (see www.gmwatch.org/profile1.asp?PrId=184&page=Borg/profile1.asp?PrId=184&page=B) and Shakarikoppa from Haveri, Karnataka has been a favourite farmer at Monsanto meetings in India after he repelled the attempts to burn his *Bt* cotton test crop.

Many people recognise the limitations of this approach, and argue that story-telling must be linked to real action on the ground. If the pro-GM lobby now has *Bt* cotton or Round-up ready soya growing successfully in farmers' fields to show the world, what is the alternative? Here, anti-GM activists have linked up with those working on small-scale sustainable agriculture. Making a positive story is seen as key, where the rhetoric of activists can become a reality on the ground. Projects thus become demonstration sites and witnessing opportunities, and so part of the overall story that can be told.[106] The narrative becomes not only one of impending GM-fuelled disaster, but one that encompasses a positive alternative.

In all three countries therefore, field-based agriculture practitioners are key elements in anti-GM networks. In southern India links to groups like AME, Green Foundation and KRRS and RFSTE demonstration farms have been important. In South Africa, Environmental Monitoring Group sustainable agriculture projects and organic producers' associations are key allies. In Brazil, the AS-PTA (assessorial e Servicios em Agricultura Alternativa) has been central, working with small scale farmers and agricultural labour unions on practical issues of agro-ecology.[107]

Taking people to these sites – politicians, regulators, scientists – is often very powerful. Organised field visits – of course chaperoned, heavily loaded, and in their own ways carrying the biases of 'rural development tourism' (Chambers 1983) – has become a standard advocacy technique in all three countries. Seeing the real conditions and challenges of farming may be important; asking questions directly to farmers (even if chosen by the intermediary NGO) can also be revealing. With so much doubt and uncertainty in other sources of evidence, this sort of experience may help tip the balance, encouraging a more sympathetic ear, ensuring a vote, or setting the terms of a court debate.

4.6 Protest and direct action

There are few subjects that generate more debate among activist groups than strategies and tactics for protest. Which ones are destructive to a wider acceptance of ideas? Which undermine attempts at informal lobbying or court cases? Is non-legal direct action, including the destruction of property and crops, acceptable? Should protests be aimed at the media, raising a profile for other actions, or be an end in themselves? There are as many views on these issues as there are activists and groups. There is no simple answer.

In all three countries, direct actions and protests of different sorts have occurred at different moments over the past decade, led by different groups and with varying consequences. In India the KRRS led the way with the destruction of *Bt* cotton field trial sites as early as 1998, preceding the wave of similar style protests in Europe. The KRRS – or at least the Nanjundaswamy faction – had had a recent history of high profile, media-grabbing direct action, targeting *inter alia* the Miss World competition, Kentucky Fried Chicken and Cargill.[108] The burning of the Cargill depot in Karnataka resulted in a good deal of condemnation in the press and among a wider group of activists because of the destructive manner of the

106 See Appadurai (2002) on creating spaces 'from below' in the context of housing activism.
107 See www.aspta.org.br
108 See McHattie (2000); Assadi (2002).

protest. With GM crops the KRRS was more careful. It attempted to negotiate with the relevant farmer, offering compensation for the crops being burned. When a farmer refused to comply – as with the now celebrated Shankarikoppa of Haveri district – and the police were called to provide protection, the KRRS backed off. These were media events – staged, dramatic, worthy of copy and providing good photo opportunities. As in Brazil, they became part of the activist global tourist circuit. International activists were invited to witness the events, and report back to their networks. Their presence provided yet another media angle, and helped assure that any police actions were not too excessive. Nanjundaswamy's lust for publicity certainly paid off. KRRS protests between 1998 and 2001 were almost continuously in the media. Sometimes they targeted the Monsanto Research Centre in Bangalore, sometimes the Monsanto/Mayhco field trial sites, sometimes major international events (such as the Asian Seed Industry Congress) and sometimes the legislative assembly. Always, though, the press were informed in advance, and press releases from the tiny Bangalore KRRS office went out the same day e-mail releases across the world. These actions were seen by some as maverick and inappropriate, but no-one could dispute that they raised the profile of the debate.

In Brazil it was the involvement of the MST which allowed a shift from conventional campaigning to more direct protest action. Linking the GM issue to the wider question of agrarian reform allowed land invasions to extend to invasions of Monsanto and other research stations, and include uprooting trial crops.[109] Like in India, these have been staged, symbolic events which have been designed for the media spotlight. The WSF events in Porto Allegre have been a focus for such actions, with international anti-GM high flyers joining the fray. Following tactics successful in Europe, Greenpeace initiated supermarket protests and leafleting, including trolley runs. Newspaper reports for each occasion meant that the GM issue was continuously in the papers, keeping up the pressure on the long drawn out legal deliberations.

In 2004 the citizen jury approach, originally sponsored by ActionAid in the northeast, moved south to a major event in Parana. This was more a mass rally than a jury process, with 3000 MST activists attending, and the governor's commitment to the cause drawing as much political capital out of the event as possible at a critical point in the electoral cycle.[110] This 'jury' event was in turn linked to further land invasions and more protests at research stations. For some in Brazil, this more direct approach now seems the only way forward in the face of the all-but-lost legal battle for a 'GM-free Brazil'. Others argue that the facts must be faced: GM is here to stay. The critical challenge is now to ensure that it does not undermine traditional farming systems and food safety.

In South Africa, the loose anti-GM network has largely shied away from direct action and protest on the scale seen in India and Brazil. There have been small demonstrations outside supermarkets and some trolley runs as part of consumer awareness raising, but nothing more dramatic. The failure to link with the broader debate about agrarian reform, and the failure of that debate to gain momentum amongst the wider population is perhaps the main reason why the anti-GM network has not taken off into anything

109 'Brazil Activists Target Monsanto,' BBC News 6 March 2003.

110 See: 'GM Soy found 'guilty' by people's court in Brazil, www.gmwatch.org, 12 March 2004; 'ActionAid Brasil puts GM on trial', www.actionaid.org/newsandmedia/features/gm_trial, March 2004.

resembling a mass movement. However, the frustrations of the seemingly endless and unproductive battles with government in formal and informal spaces – whether in committees, courts, debates and so on – is leading some to review their stance. Does a more active position now make sense? Is the debate over GM crops being won by their opponents by stealth, gradually allowing more and more crops to be planted?

4.7 The media

As the discussion above has highlighted, the media is a critical factor in constructing and disseminating knowledge, and so has a major influence on the mobilisation opportunities in other spaces. The media acts as a knowledge broker, translating ideas and projecting storylines to others. Because of the way news is created and managed, it generates villains and heroes, iconising some and demonising others. Key articulate individuals – able to offer a good sound-bite or willing to write an op-ed piece to a tight deadline – are vital to journalists. A news story must be one with two sides, so with two groups – pro and anti – pitched in battle with each other, the David and Goliath narrative of local NGO and farmer activist battling against global multinational corporate can often be regurgitated in print.

That Monsanto too has an effective national and global media sensibility adds to the ease with which news can be made. With any event, Monsanto in India for instance sends faxed briefings to a vast list of journalists. This is instant copy. With one phone call to the 'other side' a story is made. As one journalist who covered the GM issue for many years for a national English language newspaper commented: 'Stories are easy. You get a fax from Monsanto, you ring up a campaign group for the other side and you write an article'. Monsanto also encourage the linking of local and national issues to global ones, by continuously presenting good news stories from elsewhere in the world. The annual ISAAA assessments of GM crop coverage globally (e.g. James 2004) are always sent around, with an attached commentary that the country concerned is lagging behind. In the same vein, the Monsanto press offices used to pass on positive assessments on GM crops from the US. This did not go down so well in Asia, so with the growth of GM in China, the *Bt* cotton story there is the standard fare. The *Science* article prepared by Chinese researchers in 2002 (Huang *et al.* 2002) was passed on to every contact, for example. Playing on Indian fears and rivalries with China, this certainly had some effect. Monsanto have also supported educational visits to the US and elsewhere for journalists. Creating a group of tame journalists has been a key tactic for both the pro- and anti-GM lobby groups, attracting much care and attention. In the case of the pro-GM group, however, resources far exceed those available to their opponents, who cannot contemplate all-expenses-paid overseas trips. The formidable Monsanto PR machine is aided by a number of enterprising individuals. For India in particular the ever-energetic US-based university professor C.S. Prakash uses his AgBioWorld site, regular visits to India and access to the Indian media to highlight his pro-GM views. In South Africa the AfricaBio organisation has a similar approach, with its website and newsletter updates being full of information aimed at journalists and others.[111]

[111] See www.AgBioView.com; www.AfricaBio.com

Collectively the anti-GM movement also have a highly effective PR machine. Greenpeace, for example, countered the good news from China story with the release of a Greenpeace-sponsored report from Nanjing University which showed how *Bt* cotton was not faring as well as the proponents suggested (Xue 2002). This was immediately picked up by GM activists in India and summaries of the findings were transferred through cyberspace to websites and anti-GM networks, and thence to inboxes everywhere.[112]

The advent of the Internet has of course received much commentary in studies of the media and its relation to politics and activism (e.g. Hill and Hughes 1998; Blood 2000; di Maggio 2001; Meikle 2002; Agre 2002). The internationalisation of modes of discourse, the ease and speed of communication, and the ability to make virtual links have all been commented upon. But the globalised, virtual world has also created different rules and norms for assessing the authenticity, authority and legitimacy of knowledge. This is not without problems, as interviews with a range of informants showed. In one view, the new Internet information overload results in lots of garbage, and gullible publics have no way of assessing what is good and bad information. Well researched, science-based results, reviewed through the standard means of peer review is downgraded, and anything goes. The need for an independent arbiter of good information – respected, reviewed and reliable – is an urgent necessity.

Another view offered strongly in interviews, while agreeing with elements of this (no-one denies the amount of garbage available on the GM issue, from all perspectives), presents the challenge that conventional mechanisms of review and publication are surely deeply flawed. How could, for instance, the article by Qaim and Zilberman ever have been published in the 'esteemed' pages of *Science* and *Nature* if such mechanisms were fool-proof? There are inevitably interests at play. Many trade and science journals are deeply reliant on sponsorship for advertising, for example, and cannot risk causing upset. And what is more, the conventional narrow and disciplinary process of review excludes other ways of knowing. Mainstream technical journals, for example, often reject more qualitative assessments based on case studies and individual testimonies as lacking rigour. And wider arguments about ethics, morals and politics are seen as off the agenda. So what to do? Some interviewees argued that alternative ways of debating in new, un-policed spaces are required, and creating such options on the Internet is both liberatory and revolutionary. People are not as gullible as the critics suggest: they know the sources of information, and make judgements between different sites and lists. Why should this choice be guided and controlled by elite expertise, often in the pockets of particular interests?

The 'media' is thus a diverse and complex 'space'. It has both very local, parochial concerns – how a story fits with local politics and concerns of the local readership – and a wide global reach – linking emerging stories in China, the US or Europe to local issues. The media covering GM issues includes vernacular newspapers distributed in remote rural areas targeted at a very specific audience, national 'talk

[112] For international lists and networks see: http://ngin.tripod.com; www.gene.ch/genet; www.biotech_activists.iatp.org; www.gmwatch.org, among many others.

radio' shows, national newspapers, magazines and TV/radio,[113] and international Internet-based lists and sites which can be picked up by anyone who signs on. The GM debate is, par excellence, one fought within such media, with the reverberations of media attention being felt across the range of other spaces. By creating connections and forging alliances, whether at local or global scales, the media can create the conditions for sharing knowledge and ideas far beyond the locale specific focus of much activism. Scientific uncertainties, policy controversies, clashing politics and values can all be aired and debated. Contentious knowledge and politics are thus intimately linked via the media: being media-savvy and a GM activist – from whatever position – must always go together.

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Across these seven different spaces, science and knowledges more broadly are deployed in very different ways, requiring different forms of expertise, and drawing on different types of legitimacy and authority. Knowledge and politics are co-constructed, creating the focal point for contention around GM crops. However, because debates about GM crops have become so extremely polarised in a highly politicised arena, with political and commercial big interests at play, the opportunities for effective resolution of the controversy have been very constrained. While uncertainties have been exposed, alternative evidence presented, and different values, expectations and political commitments exposed, this has not moved the debate on much in any of the three countries looked at. So where does this leave the relationship between citizens, science and mobilisation? How should citizens engage with scientific controversies of this sort? Is it all a waste of time and effort? The next section will explore some of these issues focusing on the role of expertise in activist mobilisations.

5 Citizens, science and mobilisation

As the previous discussions have demonstrated, there are highly contrasting relationships between science – and knowledges more broadly – and mobilisation. In some spaces, playing by the rules of mainstream, positivist science is the only way. Thus, in presenting arguments in court or on platforms dominated by government regulators, arguments must be pitched in terms of technical risk assessment and economics. The argument against GM is then about risks to health, environment or livelihoods, or about profits and returns. This in turn may extend to more macro arguments about trade, segregation costs and market priorities, but the types of science deployed and the nature of the argument used are in essence responses to – and so framed by – the pro-GM position. This requires particular types of expertise: food safety and risk assessment, ecological impact assessment, marginal cost and production analysis, market and trade analysis, which draw on the disciplines of food science, agricultural and trade economics, pest and soil

[113] For example in South Africa, Safeage and other activists have appeared a number of times on the popular drive-time talk radio show of Tim Modise. They have also tapped in to more specialist audience, for instance through Islamic radio in Cape Town. While running their own websites (see above), they also have placed comment pieces and interview opportunities in both national and local newspapers and TV shows.

ecology, genetics and molecular biology, agronomy and crop breeding among others. Many activists have skills in these areas, but they may not have the cachet and profile to carry weight in arguments with opponents, nor the resources to develop the empirical case fully.

This is not always the case, however. The Greenpeace-sponsored research in Nanjing, China which demonstrated emergent pest resistance to GM cotton is a case in point.[114] In India some of the NGO-led surveys are as believable as other more publicised alternatives.[115] And in Brazil the agroecology work undertaken by the AS-PTA network showing the economic advantages of alternatives to GM, from farm to national economic level, are undoubtedly convincing and impressive.[116] But these are limited efforts when weighed against the research capacities of national agricultural systems and corporates combined. Corporate funding – or at least the offering of substantial 'field support' – of independent research has been a trend of late. This allows the taint of a company PR effort to be removed, and notionally independent data collection and analysis to be presented. When such work is then commended by leading luminaries it takes on more importance. Leading international scientists are regularly wheeled out in GM debates, almost invariably taking a pro-GM position. Thus in India, Nobel laureate Norman Borlaug, James Watson, the co-discoverer of the double helix, and famed rice scientist Gurdhev Kush, have all been on platforms arguing in favour of GM crops from a standpoint of 'independent', 'sound' science.[117]

Taking mainstream GM science on its own terms is therefore a huge task. The availability of sceptical scientists – let alone ones prepared to present an anti-GM position in public – is severely limited. Many scientists prefer not to enter the fray, even if they have doubts and concerns. 'This is politics', they say, 'I do science'.[118] Those that do join public platforms, provide inputs to media debates and offer advice (including critical views) to the anti-GM groups tend to be either individuals who have disassociated themselves from mainstream scientific establishment or who have retired. Thus in India, retired director of the CCMB, Dr Pushpa Bhagarva[119] and in Brazil Amazonian biologist and activist, David Hathaway[120] have both been prepared to make waves in the debate.

But, as many scientists admit, the level of debate about the GM issue within the scientific community is exceptionally limited, constrained by fears of reprimand from senior officials, threats of loss of funding, and a general lack of capacity to engage in public policy debate. The deep conservatism of the science establishment – represented by the national science academies[121] and the national agricultural research systems – has not been challenged from within. Those involved in the science movements of the past

114 www.greenpeace.org/china/en/

115 www.genecampaign.org/publications.html

116 www.aspta.org.br/publique/cgi/cgilua.exe/sys/start.htm

117 For a recent offering from Borlaug, featured prominently on the Monsanto website, see 'GM crop potential', *Business Standard* (Delhi), 18 March 2005; also see '3 Indians among top agri-biotech pioneers', *Hindu Business Line* 19 May 2003 (mentioning Khush, CS Prakash and Surinder Vasal) and 'Biotechnology: a scientific conundrum', *Frontline* 31 Jan–Feb 8 1999 reports on a speech made in Chennai by James Watson on GM crops.

118 This was a repeated refrain in interviews with scientists as part of this research.

119 See for example Bhargava (2003); 'Leading international scientist launches attack on corruption between multinationals and bureaucrats', 1 September 2003 at www.non-gm-farmers.com/news_details.asp?ID=665

120 www.netlink.de/gen/Zeitung/1998/980204.htm

121 See e.g. the Seven Academies report on GM crops (2000).

worry about this pattern. Why has the GM issue not motivated people to the extent debates about nuclear power and bombs did in the past? Why has there not been even a level of debate within science institutions, at least by students? The silence is striking. In India, for example, there has been some limited discussion in the well-respected journal *Current Science,*[122] with editorial commentary on the dangers of the industry-science complex emerging in India. At the esteemed Indian Institute of Science there have been several debates organised by students, including invites extended to leading activists such as Vandana Shiva. But it has not gone much beyond this. The more grassroots science movements – such as the long-established Kerala Sastra Sahitya Parishad[123] – have not engaged with the issue, more concerned as they are with science education.

The anti-GM networks in India, South Africa and Brazil therefore have had to go beyond a reliance on the standard routes of science communication to engage in different ways. As the previous section showed, different spaces encourage different forms of argumentation and discursive engagement, each linked to different networks of actors and different norms of defining the legitimacy and authority of knowledge. Perspectives on GM crops – from whatever standpoint – pro, anti, or somewhere in between – are necessarily highly situated. They are based on particular histories, experiences, values and, above all, politics. There is hence a fragmented, often frustratingly diffuse and ambiguous, presentation of ideas and positions by activist networks. It is far from a standard vision of a movement, with the banner waving certainty of a single ideological position. Different spaces suggest different opportunities for creating strategic alliances and enrolling others. For example, in the courts and in formal invited spaces – where the rules of the game are set by mainstream positivist science – headway can be made with more conventional networks in the science and regulatory establishment. In other spaces – such as in the media, where other forms of evidence are more compelling – commitment is sought through the use of more qualitative approaches, including video testimonies, biographies and case studies. Other forms of engagement have emerged of late that cut across this conventional formal/informal, qualitative/quantitative divide. Citizens' juries, for example, are an interesting hybrid form. They use the symbolism and formality of the court, the legitimising function of a jury, and sources of 'expert' witness and 'evidence' based on scientific expertise. Such juries operate at multiple levels – as a media event and so an advocacy tool, as a research exercise gathering information and coming to a conclusion, and as part of a political process to galvanise action amongst participants and on-lookers alike.

These multiple deployments of science and knowledge across spaces thus result in overlapping discourse coalitions – each in particular ways drawing on different forms of knowledge/science. A complex, differentiated response is the result. There is no simple 'anti-GM' view. In fact contradictory, and certainly ambiguous, perspectives are often presented. These are not resolved around a singular 'movement' position at all. The coalitions are usually temporary, tenuous and fragile. Doubt, uncertainty

122 See www.iisc.ernet.in/currsci/backissues.htm

123 See www.rightlivelihood.org/recip/kerala.htm. See also 'Messengers of Science', *Frontline*, 13 February 2004 for a review of the people's science movements in India.

and debate within the anti-GM network are all part of the picture. That said, the networks – which are more or less stable and coherent in the different countries (perhaps most so in Brazil and least so in India) – do have some common principles around which they are able to bind.

Key themes that came up again and again in interviews included: the importance of a precautionary approach; the value of the notion of sustainability; the centrality of a rights/justice approach; a commitment to reducing marginality and poverty; and a focus on issues of sovereignty and independence. These principles and terminologies all have their own intellectual trajectories and networks of support. They do not always translate well from their English language usages to others, but there is a remarkable consistency in their use, perhaps reflecting the highly internationalised nature of the anti-GM groups and individuals I talked to. In contrast to the pro-GM rationalist, technical principles of 'sound science' and 'technical risk assessment', anti-GM activists always focused on values as the basis of science and knowledge. These values explicitly inform their treatment of science and practices of citizenship and engagement. Technical rationalists, on the other hand, rely on implicit and ignored values and politics, which many deny altogether. It is perhaps this distinction that is the major difference between the pro- and anti- camps in the GM debate.

Despite the evident complexity and sophistication of anti-GM views, at a recent international conference a leading academic working on GM crops dismissed the anti-GM stance of activists in the developing world as 'anti-science mumbo jumbo'. This echoed the views of many in the mainstream, and, in various versions, it is an oft-heard refrain. This commentator went on, as others do, to argue that this was because developing country activists were 'in the pocket of the green groups in Europe', and that their approach was 'immoral and inappropriate'.[124] The resulting discussion focused on the usual, well-rehearsed response of arguing – on the assumption of a deficit in knowledge – for better public education and more effective promotion of a 'pro-science' viewpoint, based on unbiased 'facts'.

This view is offered by many who see GM crops as the only solution to boosting agricultural productivity in the developing world. And this does not just include the corporates with their obvious commercial interests. Many independent researchers and policy analysts connected to powerful and prestigious organisations, such at the Consultative Group on International Agricultural Research, the United Nations Food and Agriculture Organisation, the Nuffield Council on Bioethics, the Rockefeller Foundation, the World Bank and others,[125] propound this line too. Hopefully this paper has demonstrated how inappropriate such a response is. In certain spaces, around certain events, activists' arguments are based firmly on science, but founded on premises and based on empirical data that are at odds with the pro-GM lobbyists. That there remains controversy around the facts is clear. GM crops are not incontrovertibly good or bad. 'Public education' programmes will do little to resolve this – indeed, if defined in ill-judged ways, they will only add fuel to the controversy.

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124 Comment made in plenary at 'Transgenics and the Poor' conference, Cornell University, November 2003.

125 See for example: World Bank, (Kendall *et al.* 1997); CGIAR (1999); OECD (2000); Royal Society *et al.* (2000); Nuffield Council (1999, 2004); Conway (1999); Pinstrup-Anderson and Schioler (2001); FAO (2004).

As this and much other research has shown (e.g. Marris *et al.* 2001; Wynne 2001), there is not a 'deficit' of knowledge that needs to be filled, but a need to address the framing of the debate. Anti-GM activists argue on a broader canvas – about future technology trajectories; about desirable food and farming futures; about morals and ethics; about patented control of resources and processes, and so on. This framing is just as legitimate as the narrow risk assessment and technical/economic efficiency arguments, and anti-GM activists have firmly put such issues on the agenda, at both national and global levels. They cannot be simply dismissed as 'mumbo jumbo'.

The line that developing world anti-GM activists do not have the perspectives of poorer farmers at heart, and that they are simply following the dictates of northern environmentalists with other agendas must also be significantly nuanced. As the cases have shown, the core networks of activists in all three countries are largely urban, educated and middle class, often with backgrounds in the wider environmental movement, and certainly with strong global connections. This does not mean, though, that they operate under the beck-and-call of international environmental organisations. Far from it. As each of the case studies have shown, the international groupings are regarded with some suspicion. They are seen more as a strategic resource to make links with for local gains, than as an overarching and controlling force. Indeed, it is the national – and often very local – contexts that guide activist agendas in the three countries, not international concerns per se. These, in some respects, are seen as a diversion, drawing away energy and focus from the more pressing and immediate issues defined by national political and social dynamics.

While accusations of naivety and a simplistic approach to agrarian issues may in some respects stick, the argument that anti-GM activists do not have concerns for poorer, marginalised farmers is off-the-mark too. This concern defines their discourse, and is central to the expansion of agendas and framings. For it is a wider concern with poverty reduction and livelihood sustainability, rather than technology per se that defines the way the anti-GM argument is presented. That small-scale farmers have adopted GM crops in all three countries should not be taken as evidence that it is all a 'good thing'. By focusing solely on the technology and its adoption the pro-GM advocates 'black-box' the debate, blocking off a wider deliberation about the political, social and livelihood implications of different technology futures.

What does all this imply for the role of science and expertise in activist mobilisation? First we need to reject the anti-science, luddite accusations of the critics, and accept that what we are seeing in activist mobilisations is the strategic deployment of different types of science and knowledge. Sometimes this follows the very conventional format of positivist science (surveys, experiments etc.), legitimated by formal, accredited expertise through standard routes of peer review and so on. But sometimes different methodological traditions are drawn on, which seek authority and legitimacy from different sources. As activist organisations become more professional, sophisticated and influential, this type of expertise becomes more authoritative. And it does so, just as formal science does, through enrolling people in networks, across a diversity of spaces. Sometimes these are very local, but sometimes they have a global reach. Sometimes they start with knowledges generated in global arenas, and relate these to local settings; sometimes it is the reverse.

The 'epistemological complexity' of knowledge relations in mobilisation processes thus stands out. This has important implications for the relationships between knowledge, science and citizens, and so how we understand citizenship more generally (cf. Leach *et al.* 2005). The complexity and diversity of knowledges, and their movement across spaces and between actors, suggests that we must see knowledge about GM crops (as other contested issues) firmly in relation to a politics of citizenship and identity. With contested politics so bound up with contested knowledges, the two are inseparable. Thus a dynamic view of knowledge requires a dynamic view of the knowledge holder and the citizen. Knowledge is performed, and located in particular experiences, histories and locations, just as citizenship must be seen as performative and located (Ellison 1997).

Around the debate about GM crops, citizenship is therefore being actively created through the articulation of and debate about world views, ways of being and ways of knowing. As activists engage with the debate they not only learn about the issue – gathering knowledge, interpreting experiences – but they also learn about being a citizen in a globalised, neoliberal, market-driven world. The trajectories of activist organisations and activists themselves can be seen as part of this process of discovery. Yes, of course, activists are by-and-large middle class, urban, and often from historically-advantaged groups, but the debates generated, in all three countries in different ways, have created links to wider imaginations and politics. The issue is not simply one of representation, but of creating discursive spaces in multiple arenas to have a debate about the future.

Across these spaces, as we have seen, what may be defined as 'mainstream' science is clearly important. But it is not the exclusive source of knowledge. With the involvement of activists in the GM debate – bringing in scientists and experts as citizens – there has been an encouragement of a more democratic, less dismissive version of science and a more positive notion of engagement. Outside the polarised versions, there have been possibilities for interaction and debate, rather than arrogant dismissal, or out-right conflict. Negotiating knowledges around difficult and contentious issues means negotiating what it means to be a citizen. This occurs simultaneously at local and global scales, across different spaces. What arises is a hybrid, conflicting, overlapping, ambiguous view of a citizen. Critically, this is as much a challenge for scientists and formal experts as citizens, as it is for activists and their allies.

6 Conclusion

The GM debate is perhaps one of the most celebrated and high-profile science and technology controversies in recent times. But it is an example of many more to come. With science and technological developments moving at a lightning pace, developing countries will continue to be eager to stay in the game. Brazil, India and South Africa are part of the potential new global economic elite and will be quick to jump on new opportunities which promise competitive exports and economic growth. Thus the tensions between science and citizens will continue to be a feature of the coming years. With citizen movements well-linked through global connections, the sophistication of mobilisations will no doubt

increase. The opposition to GM crops has seen the testing and elaboration of many new styles of activism in the developing world, extending significantly the confidence and competence of citizen activists in places like Brazil, India and South Africa.

However, as the cases have shown, the contentious politics and knowledges around GM crops are not being effectively negotiated. A stale-mate exists, with little hope of resolution. Assumptions about the politics of knowledge and different types of expertise do not allow effective debate, whether in the courts, through the media, in invited workshops, or as part of research. The usual response to such an impasse is an argument for 'more participation' or 'new participatory institutions' or 'changed rules of engagement'. But such responses must take on board a wider lesson. In contexts where debates have become highly polarised, characterised by extreme contention and charged politics, the opportunities for consensus seeking strategies and negotiated outcomes are constrained (Stone 2002). Scientific facts, potential risks and uncertain dynamics are always going to be disputed, both within and outside the 'scientific community'. Resolution therefore will not come easily with 'truth speaking to power'. Instead, questions of values and politics, and how they relate to scientific interpretations, must be made explicit.

A key challenge then is to make what is often left tacit and implicit in formal deliberations explicit, and deliberate on values and politics as a critical complement to science (Jasanoff 2000, 2003, 2005). This is not a call for a naïve relativism where anything goes, but to make the relationships between knowledge, politics and values amongst diverse stakeholders a focus for policy discussion. In a highly politicised debate like over GM crops, this is particularly challenging: 'evidence' and 'truth' are always assumption-laden and contested. The consequence is that conventional spaces for dialogue, debate and negotiation are inadequate, as this paper has shown, requiring reflection on alternative approaches to convening and institutionalising debates about science and technology futures.

Anti-GM networks are linked to global players, but are firmly grounded in national contexts. The activism in all three countries cannot be read simply as being copied from and directed by events elsewhere. While sharing and interchange has been an important feature of anti-GM mobilisations, the country-focused efforts have taken on distinct characters. Through creating strategic alliances and linking the GM debate to other broader concerns, it has been possible to insert the GM issue into national and global political agendas. Is this then a 'global social movement' in the sense suggested by some literatures? Probably not. It is a much looser, more fragile network-based form of interaction (cf. Castells 1997), and always with a local origin, rationale and base.

What are the limitations of citizen activism highlighted by this paper? First, and admitted by most if not all activists, is the issue of representation. Who do small, elite groups speak on behalf of? While some engage in contortions demonstrating that they are 'of the people', others are more sanguine. They argue that by generating a debate – creating a 'discursive space' – they are opening up a discussion which would otherwise be closed down. This, they argue, is essential for democracy, and so justified on its own terms. The challenge is to encourage deliberation across diverse spaces, enlisting others in discussion. When the mainstream political and economic discourse is so dominated by the concerns of engaging in the global

market economy, the openings for wider democratic deliberation are often slim, making the role of (unrepresentative) NGOs and campaign groups key in making real the claim of a vibrant democracy.

Second is the issue of impact. How successful have these activist strategies been? Does activism make a difference, beyond marginal 'irritation' to senior ministers and others in power? Across all three countries this has been a largely a middle class, urban debate – not reaching to the 'masses' (beyond some largely tokenistic co-option). It is not an electoral issue, nor a focus for mass mobilisation. Instead, it is linked to a much wider debate about new relations between contemporary capitalism and society: issues of sovereignty, inequality, rights, justice and so on – an attempt, perhaps, to create an alternative 'grand narrative', one counter-posed to the mainstream neoliberal worldview.[126] These bigger issues are not going to be resolved around the GM debate. It is, however, emblematic of wider struggles, with very powerful geo-political forces at play. In all three countries there are relatively progressive alliance governments at the centre, all with professed commitments to social justice, development and poverty reduction. Yet the neoliberal economic agenda, the need to attract foreign investment and the pull of global politics is very strong.[127] This makes in-roads into debates based on different framings of development very hard indeed.

Debates about science and technology are however central to this, and discussions about science – and knowledge framing more broadly – are thus key, both for the GM debate, and also in the wider discussion of development futures. In the context of the GM debate, science has been addressed by activists in different ways. While some have engaged with GM science on its own terms, all are in agreement that, fundamentally, politics and values are central. Activists have managed – sometimes only temporarily and often at the margins – to articulate a position that shows how the debate about GM crops is actually a debate about a much wider set of issues: about the future of agriculture and small-scale farmers; about corporate control; about property rights; about global trade rules and so on. While pro-GM commentators argue that such activists are smuggling in debates that should not be part of the discussions, anti-GM activists argue that debates about values and politics should be seen as central to any discussions of science and technology policy. When contentious politics meets contentious knowledges it is, this paper argues, issues of values and politics that must be tackled head on. This in turn requires new and innovative approaches to convening, negotiating, framing and debating, which go beyond the failures of currently available spaces for deliberation and debate.

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126 In this sense there are perhaps more commonalities and links with the wider anti-globalisation movements, or those working on trade and development justice, such as Jubilee 2000 or the Anti-Privatisation Forum, than other single-issue movements.

127 Including new international formations – all three countries discussed here are part of the so-called BASIC group, for example.

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