



Open Research Online

The Open University's repository of research publications and other research outputs

Democratizing agri-biotechnology? European public participation in agbiotech assessment

Journal Item

How to cite:

Levidow, Les (2009). Democratizing agri-biotechnology? European public participation in agbiotech assessment. *Comparative Sociology*, 8(4) pp. 541–564.

For guidance on citations see [FAQs](#).

© 2009 Brill NV

Version: Accepted Manuscript

Link(s) to article on publisher's website:

<http://dx.doi.org/doi:10.1163/156913309X461633>

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's data [policy](#) on reuse of materials please consult the policies page.

oro.open.ac.uk

Democratizing Agri-Biotechnology? European Public Participation in Agbiotech Assessment

Les Levidow

Development Policy and Practice,
Open University, Walton Hall,
Milton Keynes MK7 6AA, UK
L.Levidow@open.ac.uk
<http://technology.open.ac.uk/cts/bpg>

Abstract

Anticipating or responding to European public concerns over agbiotech, state bodies have sponsored participatory exercises in technology assessment (TA). Some participants have sought to open up technological decisions vis-à-vis alternative futures and normative choices, but such efforts have been marginalized; the trajectory of biotechnological innovation has been protected from challenge. Questions about agbiotech *as* control have been displaced and channeled into regulatory issues and control measures. To some extent, participatory TA exercises have helped to hold governments accountable for regulatory criteria, but not for innovation choices. These participatory TA exercises generally internalize assumptions about agbiotech as societal progress. Despite aspirations to democratize technological choices, the exercises tend to biotechnologise democracy. The prospects for democratization depend upon wider, autonomous forms of participation — neither sponsored nor welcomed by state bodies.

Keywords

participatory technology assessment, agricultural biotechnology, consensus/citizens conference, lay expertise, deficit models

Public participation in techno-scientific issues has recently gained mainstream support in Europe, in response to greater conflict around innovation and regulation of controversial technologies. Scholars of Science, Technology and Society (STS) have played key roles in stimulating or organizing such participation. But participation exercises have attracted diverse views regarding their appropriate design, roles and consequences. They have also attracted various criticisms, including that participants are not representative of the public, or that the government does not make a prior commitment to follow the views expressed there, or that technical aspects are separated from other issues.

These criticisms may be accurate descriptively but they also imply particular benchmarks, even simplistic models, of direct democracy. Together they imply that participants truly representing the public could guide government decisions – as if the government had no agenda of its own, or no wider accountability to representative democracy. Amidst proposals for participation, there are diverse models of what would count as a democratic assessment of technology (Joss 1998:4). According to a survey of participatory technology assessment (TA) exercises, these models rarely have a demonstrable impact on political decision-making (Bütschi and Nentwich 2002).

Perhaps TA exercises matter in more subtle ways, which therefore demand different analytical questions regarding how to identify or assess democratic accountability. For some analysts of participatory TA, at issue is “how to make those in charge accountable” and thus “how to organize effective accountability” for government decisions (Hagendijk and Irwin 2006:56-57). Some echo concerns that participatory methods may “subvert broader democratic political processes” or may not be “fit for purpose” (Burgess and Chilvers 2006). Participatory TA has been seen as supplementing older political forms of accountability with broader social forms. But this aim leaves open other difficult questions, including “who is holding whom accountable, and by which means?” (Abels 2007:111).

As a case study for such analysis, this paper focuses on agricultural biotechnology, a sector which has faced extraordinary public protest in Europe. Agbiotech has attracted diverse forms of public participation, including open mass meetings, protests, boycotts, mass-media stunts and even sabotage. Through these means, an emerging citizenry has demanded government accountability for innovation choices. Among the various responses, many state bodies across Europe have sponsored

formal participatory exercises, beyond simply guaranteeing access to regulatory procedures. In short, agbiotech provides a rich, multi-country case study.

This paper discusses the following questions:

- How and why did state bodies sponsor participatory TA of agbiotech?
- What aims arose in designing, managing and using those exercises?
- What was the relevance of TA exercises in democratizing agbiotech?

Democratizing Technology – or Managing Conflict?

Participatory technology assessment has been promoted as a means to democratize technology, in particular by enhancing the public accountability of innovation trajectories. To accomplish this, participatory design should acknowledge that science and innovation are social, cultural and institutional activities.

As such, public engagement offers a way to be more accountable for the particular values and interests, which underpin both the governance of science and the general use of science in governance... Public engagement holds greatest value when it occurs “upstream” – at the earliest stages in the process of research or science-informed policy making... In practice, the relationship between representative democracy and participatory methods becomes most clear and complementary, when engagement is approached as a means to “open up” the range of possible decisions, rather than as a way to close this down. Choice among the options thereby identified then becomes a clearer matter of democratic accountability (Stirling 2006:5; cf. Stirling 2005).

Achieving such accountability depends upon the aims, design and management of the process.

However, public participation in technological issues has had diverse agendas. According to Lars Klüver (2006, cf. 1995), a long-time advocate at the Danish Board of Technology, public participation has recently become mainstreamed, along with changes in its policy role. Originally it was promoted as a vehicle for democratization and citizen empowerment, so that people could challenge policy assumptions and influence decisions. Now public participation goes hand-in-hand with liberalism: politics is seen as an open marketplace of opinions, to which citizens should be invited (cf. Popper 1962).

With this participation has become yet another governance tool among others for, as examples, adjusting, supplementing or enhancing the policy process. Aware that they often lack public confidence, policymakers seek methods of upstream conflict-management. Klüver argues (2006) that these professional reasons have recently driven interest by mainstream institutions in public participation and will continue to do so.

Upstream conflict-management restricts the role of participants. In the UK, for example, there have been various proposals for “upstream public engagement” between the public and scientists at an early stage (e.g. HM Treasury/DTI/DfES, 2004:105). Such engagement has been advocated as means to deliberate over possible innovation choices and thereby to make them more accountable (e.g. Wilsdon and Willis 2004). By contrast to those ambitious aims:

[Public engagement] is sometimes portrayed as a way of addressing the *impacts* of technology – be they health, social, environmental or ethical – rather than helping to shape the trajectory of technological development. The hope is that engagement can be used to head off controversy ... (Wilsdon et al. 2005:33). Indeed, conflict-avoidance or conflict-management may be built into the design of public engagement. Rather than evaluating participatory TA according to an ideal model, each case should be seen as an arena for diverse strategies, including for how to represent agbiotech, the public and relevant expertise.

Denmark 1987: Sustainable Agriculture?

The Danish consensus conference has been advocated as a “counter-technocracy,” a means to challenge expert claims through a deliberative process. A lay panel has no vested interest that differs from the general public, and any report issued by it helps to promote technology assessment (TA) as a broad societal process. The consensus conference extends a Danish tradition of *folkeoplysning*: people's enlightenment through an adult education network which builds a reflective, informed citizenry (Joss 1998:20). As its guiding principle, “a well-functioning democracy requires a well-educated and engaged population.”

Successful consensus conference participation is understood in Denmark, for example, in the way articulated by a participant: “We initiated a really good assessment process among the public” (cited in Klüver 1995:41,43). In a Danish consensus conference, then, “interested citizens” personify a political culture in which technological decisions are held accountable to public debate, mediated by Parliament.

Denmark's debate on agricultural biotechnology was initiated in the mid-1980s by environmental non-governmental organizations (NGOs). Friend of the Earth (FoE) published "debate booklets", proposing new legislation to regulate releases of genetically modified organisms (GMOs). In response to public concerns, a Parliamentary "green" majority imposed a statutory ban, in the 1986 Gene Technology Act. GMO releases would not be permitted unless there was sufficient knowledge about the ecological consequences (Toft 1996).

With this wording, the Danish government could be held accountable to demonstrate such knowledge for risk assessment; this burden of evidence meant a *de facto* ban for several years. Parliament also mandated funds for an information campaign on biotechnology. Some funds were specially earmarked for NGOs, especially FoE and some trade unions, in order to stimulate further debate on the advantages and disadvantages of biotechnology. In these ways, environmental NGOs gained extra resources and political opportunities to frame the issues for further public debate. In turn, FoE organized ten public conferences on the wider environmental consequences, on sustainable agriculture including organic agriculture, on food labelling, on animal welfare and ethics, on the Third World, on seed diversity (including patents), and on biological warfare. These debates were reported through a series of publications and statements from FoE.¹

In this context the Danish Board of Technology held its first consensus conference in 1987 on "Gene Technology in Industry and Agriculture," timed to coincide with the Parliamentary debate on this issue (Hansen et al. 1992; Klüver 1995:44). In its report the lay panel took up risk issues as well as ethical ones (Teknologinævnet 1987). Accepting a key recommendation, Parliament voted to exclude animals from the 1987-90 national research & development program for gene technology. The conference eventually had more profound effects on the Danish regulatory regime through wider public debate.

A further information campaign was coordinated by the Board of Technology and Danish Adult Education Association. During 1987-1990 they supported more than 500 local meetings all over the country in order to stimulate debate on human and non-human uses of biotechnology, including concerns about risk and ethics. Environmental NGOs were often invited to speak, as the most visible critical actors on the scene.

The government also funded a subsequent program, organized by trade unions, to stimulate further debate on the advantages and disadvantages of agbiotech. Their educational materials posed questions about sustainable agriculture, including, for example, whether genetically modified crops would alleviate or aggravate existing problems of crop monocultures (Elert 1991:12). Through this wider debate, the consensus conference indirectly influenced Parliament and thus regulatory policy.

The Danish regulatory procedure can be contrasted to the mid-1990s EU-wide regulatory procedure. In the latter the dominant member states implicitly took for granted the eco-efficiency benefits of herbicide-tolerant crops, while disregarding the herbicide implications or assuming them to be benign (Levidow et al. 1996, 2000). By contrast, Danish regulators have been held accountable publicly for assessing the broad implications of GM crops for agricultural strategy, herbicide usage and the environment. Such judgments are scrutinized by Parliament's Environment Committee, often by drawing upon specific questions from NGOs. Under such domestic pressures, Danish representatives in turn proposed that EU-wide risk assessments evaluate those implications at the EU level (Toft 1996, 2000). This proposal was eventually accepted in the late 1990s (Levidow et al. 2000).

In short, Danish citizen participation enhances government accountability for regulatory criteria by going beyond optimistic assumptions about environmental benefits. GM crops are subjected in Denmark to criteria of sustainable agriculture, which in turn are opened up to the lay expertise of agbiotech critics. Environmental NGOs thereby find greater scope to influence regulatory procedures and expertise.

However, agri-innovation choices became more contentious in Denmark in the late 1990s. NGOs demanded alternatives to agbiotech and to intensive agricultural methods. In a 1999 consensus

¹ Much information here, not available in English-language documents, was supplied by Jesper Toft. He was centrally involved in FoE Denmark, which calls itself NOAH, www.noah.dk

conference, the lay panel asserted the need for extra measures – not only for product safety, but also to prevent GM products “becoming controlled by monopolistic companies” and to evaluate ethical issues (Einsiedel 2001). As conference organizers emphasized, these proposals were expressing citizen viewpoints, thus providing a basis for dialogue with decision-makers (Teknologinævnet 1999). The panel’s proposals challenged the assumptions and limits of the EU legislative framework. Yet public demands for accountability were being channeled into more stringent measures to regulate biophysical risks. This pervasive tension has parallels in later TA exercises.

Germany 1991-92: Participation Trap

Since the time that the German government promoted agbiotech, in the 1980s, this policy has provoked widespread protest –from the Green Party, from environmentalist groups and from local campaigns. Although critics gained high-profile attention in the mass media and civil society, their views remained marginal to official procedures, unlike German corporatist arrangements for labor issues. Opposition to agbiotech split civil society and the major political parties (Gill 1996).

Public controversy in Germany focused on herbicide-tolerant crops, given their potential for spreading this trait and thus changing patterns of herbicide usage. To address such conflicts, the government in the early 1990s sponsored a TA exercise on GM herbicide-resistant crops. Funding came from the Ministry of Industry and Research, which was strongly promoting biotechnology. It was initiated and coordinated by the Berlin *Wissenschaftszentrum* (Science Centre) as an experiment in environmental conflict management. The fifty-odd participants had quasi-expert roles: they included overt proponents and opponents of HR crops as well as representatives of regulatory authorities, agricultural associations, consumer organizations, and others.

From the start, conflict erupted over how to define the relevant scientific issues and the expertise needed to evaluate them. Organizers argued that broad participation was needed in the TA exercise in order to deliberate over the arguments arising in the polarized public debate on agbiotech. The TA exercise was designed to evaluate the arguments for and against herbicide-resistance GM technology, and particularly its possible consequences. It was not designed to evaluate alternative options for weed control in agriculture. Thus the procedure was “a technology-induced TA, not a problem-induced TA” (van den Daele 1995:74).

Environmental NGOs at the TA exercise nonetheless advocated a problem-induced approach. They wanted participants to compare biotechnology products with other potential weed-control methods, as alternative solutions to agricultural problems. However, this proposal was rejected by the organizers (Gill 1993). Consequently, the narrow remit set difficult terms for participation by the broadly representative individuals from NGOs – indeed, difficult terms for their expert status.

As organizers acknowledged, “The TA implicitly accepted the matter-of-course development of technology as the starting point” as well as possible risks as the main grounds for state restrictions: “If critics fail to provide evidence of relevant risks, the technology cannot be banned.” So critics held the burden of evidence for any risks. Advocates held the burden to demonstrate benefits, though failure to do so would have no bearing upon regulatory decisions (van den Daele 1995:75). This framework marginalized alternative agronomic solutions while reinforcing the dominant system, and thus exemplified “intensive farming as the reference system.” Within this framework, participants themselves defined their controversies as debates about empirical evidence, for example regarding the possibility of environmental damage – not about values and goals (van den Daele 1995:76-77).

The organizers aimed to include and deliberate all viewpoints on risk-benefit issues. By subjecting expert views to scrutiny, the TA could reach conclusions about empirical claims, rather than political or ethical ones. “This procedure placed participants under massive pressure either to admit consensus or justify dissent,” especially through detailed empirical evidence (van den Daele 1995:80).

From NGOs’ standpoint, the technology-induced TA framework effectively favored experts in specialized technical areas, as examples in gene flow and herbicide effects. In practice, the TA exercise set a lower burden of evidence for demonstrating benefits than for demonstrating risks, during a period before much empirical research had been done on risk scenarios. Consequently, the discussion emphasized environmental benefits, especially the prospects for farmers to use less harmful herbicides and or lower quantities of them (Gill 1993).

On the basis of expert reports, the TA symbolically normalized any risks. According to agbiotech proponents, echoing the government’s advisory body, any risks from GM herbicide-tolerant crops are similar to those from conventional crop plants and herbicide usage. “In many areas it was argued that there was no need for political action because the identifiable problems could be dealt with in the established registration procedures.... if one agreed to the ‘normalization’ of the risks” (van den Daele 1995:82). In this way, the TA exercise undermined NGO claims about novel or unknown risks; once normalized, any risks are manageable through regulatory procedures, even contemporary ones.

A technology-induced TA framework poses a dilemma of participation for agbiotech critics. Once they enter the exercise, “They have to criticize a technology which promises to satisfy some needs which may even be produced by the technology itself ...” (Gill 1993:74). That is, putative benefits satisfy “needs” which are predefined by biotechnological solutions for intensive monoculture. A technology-induced TA thereby tends to accept and reproduce the social vision built into the technology. Environmental NGOs and their associated research institutes face a difficult choice: either play a quasi-expert role within this framework and thus help legitimize it or abandon this role and be treated as merely lay voices.

After much conflict, environmental NGOs and their associated research institutes decided to withdraw before the TA exercise reported its conclusions. They gave several reasons for withdrawing, including that their voluntary participation was occupying too much time, especially the task of commenting on long expert reports (van den Daele, 1995:81). According to an NGO expert, “I had not imagined that you could destroy participation by throwing paper on top of people” (cited in Charles 2001:107). By withdrawing, they could devote more resources to public protest and preserve their credibility with NGO members and activists (Gill 1993:81-82).

But they were criticized for withdrawing by the WZB coordinator:

One cannot present one’s position in public as scientifically substantiated and then cast fundamental doubt on science as neutral... Participation in the procedure implies the readiness to submit oneself on the empirical issues to the judgment of science (van den Daele 1995:84; also 1994).

However, at issue was the range of questions to be answered by science, their normative assumptions, and the alternative technological options to be considered as comparators for agri-environmental assessments. Some questions from participants were pre-empted or marginalized by the TA exercise, in particular by constructing particular boundaries between expert and lay voices.

Societal futures were reduced to scientific issues, readily assessable by experts in “the state of the art.” Civil society representatives thereby found themselves in a “participation trap:” they could either participate within the government’s risk-benefit framework for GM crops per se or else be marginalized. Overall the exercise reinforced the government’s policy framework and its public unaccountability. In a similar way, societal conflict over agri-innovation issues was channelled into risk assessment through regulatory procedures. Together these practices extended and reinforced the *Rechtsstaat*, at least until government policy began to change in 2002.

France 1998: A Benign Technocratic State

By 1997 French regulatory policy faced a legitimacy crisis. France had led efforts to gain EU-wide approval for GM crops, but now these were opposed by a broad range of organizations. The Confederation Paysanne, representing farmers who elaborated a peasant identity, opposed agbiotech while counterposing “quality” alternatives to industrialized agriculture (Heller 2002). An oppositional petition was signed by many prominent scientists, not necessarily anti-agbiotech, but all of them concerned about failures of regulators to develop appropriate ecological expertise and risk research (Marris 2001).

In February 1997 the Prime Minister decided not to authorize commercial cultivation of Ciba-Geigy’s Bt 176 GM maize in France, even though French regulators had led EU authorization of the same product. This unstable policy indicated a crisis of official expertise within an elite-technocratic political culture. According to some critics, an official “objectivity” too narrowly defined the relevant expertise. As an alternative approach, expert procedures would open up a scientific critique of possible options; this space would provide the expertise necessary for decisions (Roqueplo, 1996:67, my paraphrase). By incorporating counter-expertise, regulatory procedures would develop an *expertise contradictoire* (contradictory expertise) which would enhance democratic debate and state accountability for decisions.

In November 1997 the government announced a set of measures, including a plan to sponsor a consensus conference on GMOs, with reference to the Danish Model. This event was later officially called a Citizens’ Conference. As an official rationale, it was said by the Ministry of Agriculture to provide “a new way of elaborating decisions’ and a means to implement ‘participatory democracy.’” Yet the government never clarified the relation between the citizens’ conference and its own decision-making procedure (Marris and Joly 1999). This relation was subtly played out within the conference process, in particular by how expert roles were defined.

From the start, the conference was designed to re-assert the benign expertise of the state, especially the Parliament which saw itself as the only legitimate representative of the Nation. Organization of the citizens’ conference was delegated to a Parliamentary unit, Office Parlementaire d’Évaluation des Choix Scientifiques et Technologiques (OPECST), which symbolized a political neutrality separate from the government. OPECST appointed the steering committee, which in turn

decided that the panel membership should represent diverse views of ordinary citizens – rather than stakeholders in the debate. It also decided which “experts” – all of them scientists – would give briefings or testimony to the panel, thus framing the issues in advance (Marris and Joly 1999). Organizers saw these arrangements as necessary “to prepare a public debate which is not taken over by one side or the other,” that is to correct or avoid biases in the existing public debate (OPECST 1998a). Implicitly, such biases included anti-agbiotech NGOs on one side and Monsanto on the other, especially from the perspective of the Left-Green Parliamentary majority.

Held in 1998, the conference included different framings of the policy problem. At the public hearings, the citizens’ panel often challenged claims by experts about risks and benefits of GM crops. According to this panel’s report, control by multinational companies could threaten farmers’ independence. Genetically altered species pose a risk of standardization. And GM rapeseed poses known risks of uncontrolled proliferation, both through pollen and seeds. Nevertheless GM crops could bring economic benefits to European agriculture (OPECST 1998b; Boy et al. 1998).

Taken together these arguments implied the need for national public-sector expertise in agbiotech innovation.

The panel’s recommendations focused on institutional arrangements for better managing agricultural biotechnology. Such measures included the following: greater social participation in scientific advice; public-sector research on ecological risks and agbiotech innovation; a system to ensure traceability of food derived from GM crops; and adequate labeling to inform consumer choice. “Until these conditions are satisfied, part of the panel believes that a moratorium would be advisable” (OPECST 1998b; Boy et al. 1998). By advocating state funds for agbiotech innovation, the panel accepted the government’s problem-definition of a national technological gap whose solution requires public-funded science, presumed to be benign. The panel’s concerns about rapeseed complemented the French government’s decision to oppose approval of GM herbicide-tolerant rape, on grounds that gene flow could complicate weed control (Marris and Joly 1999).

The panel’s conclusions were translated into policy advice by the Parliamentary organizers, as if they were neutral experts operating in the public good. Moreover, having attended the proceedings, the OPECST President presumed to speak for the panel:

Taking all these views into account he then himself adopted a position on a number of topics... He has identified the issues and looked into peoples’ fears and concerns (OPECST 1998b).

This translation can be illustrated by the strategic issue of how to structure expert advice. The panel had proposed that a citizens’ commission should be part of the scientific advisory committee. Yet OPECST recommended instead that it be kept separate, because this could better perpetuate a neutral image of scientific advice and thus reinforce a boundary between expert and lay roles.

The panel’s advice anticipated the general direction of government policy: more stringent regulatory criteria, risk assessment by a broader scientific expertise, and “independent” risk research which was equated with public-sector institutes. It helped to legitimize and reinforce such initiatives, which heretofore had not been universally accepted within the government. In June 1998 the government announced measures along those lines (Marris and Joly 1999). Institutional reforms emphasized expert procedures to minimize the risks and enhance the benefits of a controversial technology.

Despite its limitations, the citizens’ conference initiated a new form of active public representation and knowledge-production. Panel members explored techno-scientific and social aspects together from the perspective of ordinary citizens. They sought to inform decision-makers about the views of those who do not normally speak out – and who do not feel represented by political parties, trade unions, or environmental and consumer NGOs. However, this potential for participatory evaluation, especially for considering alternative options, was limited by the overall structure, especially the small opportunity to interact with designated experts (Joly et al. 2003).

Overall the citizens’ conference was used to legitimize state claims to represent the public good, especially through expert roles. OPECST selectively promoted some accounts of agbiotech and its regulation as the expert ones, while explicitly speaking on behalf of citizens. The Agriculture Ministry had claimed to implement “participatory democracy,” yet the exercise extended the French tradition of technocratic governance (Marris and Joly 1999).

Within this framework, expert roles remained the exclusive realm of the state authorities and their officially designated advisors. Ordinary people could question experts and recommend institutional reforms, but Parliamentary experts would speak officially for them. Thus the process reinforced lay/expert boundaries, in the face of public challenges to the official expertise for agbiotech.

UK 2003 Public Dialogue: Policing Boundaries

From the late 1990s onwards the UK had a widespread public controversy over agbiotech. Protest actions and attacks on field trials gained public support by linking GM crops with various issues – Bovine Spongiform Encephalopathy (BSE) and other food scares, globalization, ‘pollution’, and others (Levidow 2000). The government faced an impasse over regulatory decisions, especially over the criteria for permitting a GM herbicide-tolerant maize which the EU had approved in 1998. As a key issue, conservation agencies had warned that changes in herbicide usage could harm farmland biodiversity, so the government funded farm-scale trials to monitor such effects.

To address wider issues beyond risk regulation, the government had created the Agricultural and Environment Biotechnology Commission in 2000. Its report, *Crops on Trial*, advised the government to initiate an “open and inclusive process of decision-making” within a framework that extends to broader questions, beyond herbicide effects. It proposed a “wider public debate involving a series of regional discussion meetings” (AEBC 2001:19, 25). The government was persuaded to sponsor this, alongside the intense, sporadic debate which was unfolding anyway.

Called “GM Nation?,” the official public debate was carried out in summer 2003. Beforehand the government promised vaguely “to take public opinion into account as far as possible.” The exercise was designed for the organizers to gauge public opinion rather than for participants to deliberate a collective view on expert matters (Horlick-Jones et al. 2006). “GM Nation?” also aimed to elicit views of the ordinary public, rather than organizational representatives – an artificial distinction, given that most civil society organizations and wider social networks had discussed agbiotech in previous years.

An overall Public Dialogue had a tripartite structure which explicitly distinguished between lay and expert issues. “GM Nation?” was designed mainly for the lay public. An expert panel carried out a Science Review of literature relevant to risk assessment. And a government department carried out a Costs and Benefits Review of GM crop cultivation in the UK.

The Public Dialogue was designed in these three separate parts, with an explicit aim that they would work closely together. The three procedures were kept formally separate, yet the supposedly lay and expert issues became intermingled in practice. The official boundaries were both challenged and policed, thus constructing the participants in contradictory ways.

Representing Public Views?

“GM Nation?” featured several hundred public meetings open to anyone interested, and drew over 20,000 participants (DTI 2003). When participants in “GM Nation?” largely expressed critical or skeptical views towards agbiotech, arguments ensued over whether they were “representative” of the public. According to a pro-agbiotech coalition, the Agriculture and Biotechnology Council, the exercise had been hijacked by anti-biotech activists, so the format was not conducive to a balanced deliberation of the issues.

According to academic analyses, however, such a line of criticism frames the public as atomised individuals who have no prior opinion. By contrast, the “GM Nation?” exercise predictably drew a more specialized public, largely suspicious or hostile to agbiotech. Participants represented both themselves as individuals and wider epistemic networks. The debates were filling an institutional void, in the absence of any other formal opportunity to deliberate the wider issues (Reynolds and Szerszynski 2006).

The government sponsors had asked the contractors to involve “people at the grass-roots level whose voice has not been heard.” As official evaluators noted afterwards, however, it was problematic to distinguish clearly between “an activist minority” and a “disengaged, grass-roots minority.” Many participants in “GM Nation?” were politically engaged in the sense that their beliefs on GM issues formed part of their wider worldview. Yet policymakers tend to construct “the public” as an even-handed majority, and therefore legitimately entitled to participate in engagement exercises (Horlick-Jones et al. 2004:135; Horlick-Jones et al. 2006). Indeed, “grass-roots” conventionally means locally organized activists, but this term was strangely inverted to mean a passive, uninformed public.

As envisaged by the sponsors, separate focus groups would allow the public to frame the issues according to their own concerns, and yet special measures were needed to realize policymakers’ model of the public. They saw the open meetings being dominated by anti-biotech activists, unrepresentative of the general public. Politically inactive citizens were seen as truly representative and thus as valid sources of public opinion, unlike “activists.” To exclude the latter individuals from focus groups, candidates underwent surveillance and screening. “Perhaps paradoxically, the desire to allow the public to frame the discussion in their own terms led the organizers to rely on private and closely monitored forms of social interaction.” According to this ideal model of the focus groups, the organizers would be listening to the *idiotis*, by analogy to ancient Greek citizens too ignorant to fulfill their responsibilities (Lezaun and Soneryd 2006:22-23). In this way, more informed, expert citizens would be excluded from representing the public.

“GM Nation?” was intended to canvass all views and concerns about agbiotech, but there were boundary disputes over issue-framings, admissible arguments and participants’ roles. Some used the opportunity as politically engaged actors in their own right, not just as indicators of public opinion. Attending shortly after the US-UK attack on Iraq, some participants drew analogies between government claims about agbiotech and about Weapons of Mass Destruction. They suspected that the government was concealing or distorting information in both cases; they wondered whether it would ignore public opinion towards agbiotech, as in the attack on Iraq. Initially the chair tried to steer the discussion back to agbiotech, on grounds that “GM Nation?” was not about the Iraq war, though participants still elaborated the analogy. Thus the public consultation had a disjuncture between public politics and government policy as understood by the sponsors of the exercise (Joss 2005b:181).

Expert/Lay Roles

For the carefully selected focus groups, the organizers commissioned “stimulus material” so participants would have a common knowledge-basis for discussion. The Steering Group asked the contractors to supply “objective” information. Yet there were grounds to include “opposing views” because “this is often how people encounter information in real life” according to official evaluators of “GM Nation?.” The material did ultimately include divergent views, but their sources were removed from the workbook for focus groups. Afterwards official evaluators questioned “the extent to which information is meaningful if it is decontextualized by stripping it from its source” (Horlick-Jones et al. 2004:93-94; Walls et al. 2005).

Indeed, people often make judgments on the institutional source of expert views, but they had little basis to do so in “GM Nation?” focus groups. Omission of the sources was not simply a design deficiency in the exercise. By default, the issue of expert credibility was diverted and reduced to scientific information about biophysical risk. Participants had little basis to evaluate such information, so the exercise constructed a lay/expert boundary which constrained public roles even more narrowly than in the wider public debate.

Separate from “GM Nation?,” the GM Science Review (2003) was officially limited to a panel of experts evaluating scientific information. As a high-profile part of this Review, the Royal Society announced a meeting to “examine the scientific basis” of various positions. Opening the event, the chair announced the laudable aim “to clarify what we know and do not know” about potential effects of GM crops. In the morning, agro-ecological issues were analysed in a rigorous way, especially for their relevance to the prospect that broad-spectrum herbicides may be widely used in the future. But those complexities were ignored when considering GM herbicide-tolerant crops in the afternoon (Levidow 2003). By downplaying expert ignorance, the overall structure did not facilitate a debate about knowledge versus ignorance, nor provide much basis for public involvement.

Moreover, the boundaries of “science” were policed along pro-biotech lines. Inconvenient issues, findings or views were deemed non-scientific. For example, speakers freely advocated the need for agbiotech to solve global problems, such as environmental degradation, the food supply and others, but the chair cut off anyone who questioned these claims – for going beyond science (Levidow 2003). Thus biotechnological framing assumptions were reinforced as “science,” along with the expert status of their proponents – while skeptics were marginalized as merely expressing lay views on extra-scientific issues.

In sum, the UK Public Dialogue involved a struggle over how to construct the public, especially in relation to expertise. The structure and management imposed boundaries between apolitical grassroots versus activists, as well as between lay versus expert status. Nevertheless participants challenged those boundaries, performed different models of the public, and questioned dominant expert assumptions.

Conclusions: Democratizing Agbiotech?

In the Introduction I posed three questions: About state sponsorship of participatory TA for agbiotech, about the aims of these exercises, and about their relevance for democratizing the debate. Now we see that in responding to or anticipating public concerns about agbiotech, participatory TA exercises were sponsored with diverse, overlapping, even contradictory aims. From various deficit models of public unease, sponsors and other advocates sought: to democratize technology, to educate the public, to counter “extreme” views, to gauge public attitudes, to guide institutional reforms, and to manage societal conflicts. Such aims had a bearing on the design, management, staging and process of each exercise. Each process manifested diverse accounts of technology, the public, expertise and democracy (cf. Joss 2005a).

In these TA exercises, individuals were pre-selected to participate in a group process, questioning expert claims in order to reach a group view. Participants deliberated the normative,

value-laden basis of expert claims, thus developing a lay expertise; they went beyond simply questioning experts (cf. Kerr 1998; Wakeford 1998). By contrast to a negotiation among interest-groups, participants addressed the public good by appealing to common societal interests and problems (cf. Hamlett 2003).

However, dominant problem-definitions incorporated or marginalized critical voices. Some problems were treated as common ones for group deliberation, while others were ignored or marginalized as uncommon ones, inconvenient for a group consensus or for a thinkable government policy. Some participants questioned whether agbiotech would provide a means for sustainable agriculture and a benign control over the agri-food chain; others suggested the need for alternatives. These questions were generally channeled into regulatory criteria and were reduced to control measures.

In such ways, participatory TA exercises biotechnologized democracy. The innovation trajectory was protected as societal progress, partly by diverting any challenge into managerial problems. Discussion generally focused on appropriate regulatory arrangements for agbiotech, represented as a series of potentially beneficial products; at issue was how to minimize risks and maximize benefits. Citizen roles were modeled according to the biophysical “risk” frameworks of EU and/or national legislation, thus generating conflict over such roles.

In analogous ways, public participation in EU agbiotech regulatory procedures manifest tensions between broad comments submitted and official “scientific” criteria for relevant evidence (Bora and Hausendorf 2006; Ferretti 2007). By serving a statutory procedure, science closes the factual debate; politics is excluded by pre-determined concepts of risk, nature, citizen, public, and others.

More generally, “wherever a sharp political controversy appears within the context of a rather narrow legal-procedural framework for citizen participation, we can expect a variety of depoliticized positions with different frames of reference” (Bora 2008). Through such procedures, conflicts over societal futures can be managed “by re-absorbing discourses of polarity into a system of ‘legitimate differences’ and by defining the locations where differences can be articulated,” as anticipated by a critical analysis a decade earlier (Gottweis 1998).

Regardless of other views held by TA participants, any wider deliberation was constrained: by a search for consensus, by the design of each exercise, and by the government policy framework. This overall context limited what could be said with influence on the process, and thus what roles could be performed credibly by participants (cf. Hajer, 2005). The process internalized and reinforced policy assumptions about agbiotech as essential progress – albeit perhaps warranting more rigorous, publicly accountable regulation. Through a discursive depoliticization, contentious issues were displaced onto the management problems of an inevitable future, as in neoliberal governance more generally (cf. Goven 2006; Pestre 2008). Consequently, tensions arose between discussing a “common” problem – how to make agbiotech safe or acceptable – versus encompassing problems of political-economic control, innovation choices and societal futures.

These tensions took the form of various boundary conflicts, which erupted more starkly in some cases. In the German TA exercise, an extreme case, the NGO representatives could maintain their official expert status only by accepting a risk-benefit framework. Instead they rejected these terms for participation, demanded a broadly comparative assessment, and thus were relegated to the lay public or irrational objectors. In the 2003 UK Public Dialogue, the official structure nominally separated all relevant issues into three components – public concerns, scientific risk assessment, and economic benefits. Accordingly, expert matters were formally separated from other issues for discussion by lay participants. Despite this official tripartite structure, all of the issues became mixed in practice; their boundaries were both contested and policed.

In the design and management of TA exercises, then, boundaries are imposed – between biotechnological imperatives versus alternative options, between scientific versus policy issues, as well as between expert versus lay roles – which close down issues. By contesting those boundaries, some participants open up policy issues and perform different models of the public, implying broader roles for citizens. These performative interactions produce different understandings of the policy problem (cf. Hajer 2005).

If analyzed in this way public engagement can “clarify what conflict is really about” (de Marchi 2003).

In each TA exercise, issues are opened up beyond the government policy framework, though they remain more narrow than in the parallel public debate. Ultimately the process reinforces official boundaries between scientific and extra-scientific issues, as well as between expert and lay roles (though these boundaries take different forms across the national cases). Agbiotech is being co-produced along with particular models of expertise, citizenship and their relationship. Institutions are created or adapted in designing and managing each TA process accordingly.

To some extent, state-sponsored participatory TA exercises anticipate, stimulate or reinforce policy changes which enhance the state's accountability for regulatory frameworks. Such outcomes depend upon a longer-term socio-political agency beyond the TA exercise and its panel. However, the TA exercises do not help publics hold the state accountable for its commitment to agbiotech as an objective imperative.

What does this mean for efforts to democratize technology (e.g. Stirling 2005:229)? In the state-sponsored cases analyzed here, participatory methods and representative democracy do not seem complementary. Or perhaps they are perversely so. In performing publics, participation symbolically sets boundaries on citizen roles and closes down innovation (non)choices. By default, if not by design, such issues are channeled into regulatory arenas, which thereby carry the burden of conflicts over societal futures. Thus state-sponsored participatory TA readily complements neoliberal representative democracy and its unaccountability, while reproducing its contradictions through contested boundaries.

In order to open up societal choices, participatory exercises should:

- Synchronise with key periods of government decision-making.
- Facilitate overlaps between 'lay' and 'expert' roles.
- Examine the assumptions and limits of 'risk' frameworks.
- Encourage scrutiny of 'technical' aspects as value-laden, socio-political issues.
- Explore the societal problems that supposedly need a technological solution while also considering alternatives, especially as regards who may be empowered or disempowered.

Such features may provide some scope for influence by activists beforehand and by participants within the exercises. Likewise those features should be evaluated as a basis for judging whether or how participation can truly help to democratise technology choices. Regardless of state-sponsored exercises, the overall prospects will depend upon wider, autonomous forms of participation — neither sponsored nor welcomed by state bodies.

Acknowledgements:

Helpful editorial comments on previous versions were received from the following colleagues: Gabi Abels, Bernhard Gill, Dominic Glover, Joanna Goven, Christine Hauskeller, Maria Paola Ferretti, Pierre-Benoit Joly, Mercy Kamara, Huei-Chih Niu, Dominique Pestre, Stefan Sperling, Andy Stirling, Zoe Sujon, Jesper Toft, John Walls, Sue Weldon, Bernhard Wieser and Richard Worthington.

Also helpful were comments on related talks at these events:

- Participatory Approaches to Science and Technology (PATH) conference, June 2006, Edinburgh.
- Critical Social Science for/on Contentious Technologies, workshop in November 2006, Egenis Centre, Exeter.
- Critical Issues in Science and Technology Studies, 6th Annual IAS-STIS Conference, May 2007, Graz.
- Science and Democracy Network annual meeting, June 2007, Cambridge, UK.
- Reconstruction Agro-Biotechnologies for Development', 3-4 November 2007, Kyoto.

A longer version has more case studies and more systematic reference to analytical perspectives (Levidow 2007).

References

- Abels, Gabriele. 2007. "Citizen involvement in public policy-making. Does it improve democratic legitimacy and accountability? The case of pTA." *Interdisciplinary Information Sciences* 13(1):103-116.
- AEBC. 2001. *Crops on Trial*. (<http://www.aebc.gov.uk>)
- Boy, D., Donnet-Kamel, D., and Roqueplo, P. 1998. A Report on the Citizens Conference on Genetically Modified Foods (France, June 21-22, 1998), including the report prepared by the French Lay Panel, <http://www.loka.org/pages/Frenchgenefood.htm>
- Bora, Alfons. 2008. "Technoscientific normativity and the 'iron cage' of law." *Science, Technology and Human Values*, forthcoming.
- Bora, Alfons and Heiko Hauseldorf. 2006. "Participatory science governance revisited: normative expectations versus empirical evidence." *Science and Public Policy* 33:479-488.
- Burgess, Jaqueline and Jason Chilvers. 2006. "Upping the ante: a conceptual framework for designing and evaluating participatory technology assessment." *Science and Public Policy* 33:713-728.
- Bütschi, Danielle and Michael Nentwich. 2002. "The role of participatory technology assessment in the policy-making process" in *Participatory Technology Assessment: European Perspectives*, edited by S.Joss and S.Bellucci. London: Univ. of Westminster Press.
- De Marchi, Bruna. 2003. "Public participation and risk governance." *Science & Public Policy* 30:171-76.

- DTI. 2003. Reports on "GM Nation?" London: Dept of Trade & Industry (<http://www.gmnation.org.uk/>)
- EEC. 1990. Council Directive 90/220 on the Deliberate Release to the Environment of Genetically Modified Organisms. *Official Journal of the European Communities* L 117, 8 May:15-27
- EC. 2001. European Parliament and Council Directive 2001/18/EC of 12 March on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC. *Official Journal of the European Communities* L 106:1-38.
- Einsiedel, Edna F., Erling Jelsøe and Thomas Breck. 2001. "Publics at the technology table: The consensus conference in Denmark, Canada, and Australia." *Public Understanding of Science* (10):83-98.
- Elert, C. et al. 1991. *Biotechnology at Work in Denmark*. Copenhagen: Danish Board of Technology (Teknologinævnet).
- Ferretti, Maria P. 2007. "What do we expect from public participation? The case of authorising GMO products in the European Union." *Science as Culture* 16(4):377-395.
- Gill, Bernhard. 1993. "Technology assessment in Germany's biotechnology debate." *Science as Culture* 4(1):69-84.
- , 1996. 'Germany: splicing genes, splitting society', *Science & Public Policy* 23 (3): 175-79.
- GM Science Review. 2003. *First Report: An open review of the science relevant to GM crops and food based on the interests and concerns of the public*. London: GM Science Review Panel, (<http://www.gmsciencedebate.org.uk/report/pdf/gmsci-report1-pt1.pdf>)
- Gottweis, Herbert. 1998. *Governing Molecules: The Discursive Politics of Genetic Engineering in Europe and the United States*. Cambridge, MA: MIT Press.
- Goven, Joanna. 2006. "Dialogue, governance and biotechnology: acknowledging the context of the conversation." *Integrated Assessment Journal* 6(2):99-116.
- Hagendijk, Rob and Irwin, A. 2006. "Public deliberation and governance: engaging with science and technology in contemporary Europe." *Minerva* 44(2):167-184.
- Hajer, Maarten. 2005. "Setting the stage: a dramaturgy of policy deliberation." *Administration & Society* 36(6):624-47.
- Hamlett, Patrick W. 2003. "Technology theory and deliberative theory." *Science, Technology and Human Values* 28(1):122-140.
- Hansen, L. et al. 1992. *Consensus Conferences*. Copenhagen: Danish Board of Technology.
- Hansen, Janus. 2006. "Operationalising the public in participatory technology assessment." *Science and Public Policy* 33(8):571-584.
- Heller, Chaia. 2002. "From scientific risk to *paysan savoir-faire*: peasant expertise in the French and global debate over GM crops." *Science as Culture* 11(1):5-37.
- HM Treasury/DTI/DfES, 2004. *Science and Innovation Investment Framework 2004-2014*. London: HM Treasury.
- Horlick-Jones, Tom et al. 2004. *A Deliberative Future? An Independent Evaluation of the GM Nation? Public Debate about the Possible Commercialization of Transgenic Crops in Britain, 2003*, Understanding Risk Working Paper 04-02, Norwich: University of East Anglia.
- Horlick-Jones, Tom et al. 2006. "On evaluating the GM Nation? Public debate about the commercialization of transgenic crops in Britain." *New Genetics and Society* 25(3): 265-88.
- Joly, Pierre-Benoît; Marris, Claire, Hermitte, M.A. 2003. "A la recherche d'une 'démocratie technique'. Enseignements de la conférence citoyenne sur les OGM en France." *Natures, Sciences et Sociétés* 11(1):3-15.
- Joss, Simon. 1998. "The Danish consensus conferences as model of participatory technology assessment." *Science & Public Policy* 25(1):2-22.
- , 2005a. "Lost in translation? Challenges for participatory governance of science and technology." Pp. 197-219 in *Wozu Experten/Why Experts?*, edited by H. Torgersen and A. Bogner. Wiesbaden: Verlag für Sozialwissenschaften.
- , 2005b. "Between policy and politics." Pp. 171-88 in *Democratization of Expertise? Exploring Novel Forms of Scientific Advice in Political Decision-Making*, edited by S.Maasen and P.Weingart. Dordrecht: Springer, Sociology of the Sciences Yearbook.
- Kerr, Anne, Sarah Cunningham-Burley and Amanda Amos. 1998. "The new genetics and health: mobilizing lay expertise." *Public Understanding of Science* 7:41-60
- Klüver, Lars. 1995. "Consensus conferences at the Danish Board of Technology." Pp. 41-49 in *Public Participation in Science: the Role of Consensus Conferences in Europe*, edited by S. Joss and J. Durant. London: Science Museum.
- , 2006. "New trends in public participation." PATH conference, (<http://www.macaulay.ac.uk/pathconference>)
- Levidow, Les. 1998. "Democratizing technology – or technologizing democracy? Regulating agricultural biotechnology in Europe." *Technology in Society* 20(2):211-226.
- , 2000. "Pollution metaphors in the UK biotechnology controversy." *Science as Culture* 9(3):325-351.
- , 2003. "Policing the Scientific Debate on GM Crops: the Royal Society meeting of 11th Feb 2003." (<http://www.gmsciencedebate.org.uk/topics/forum/0070.htm>)
- , 2007. "European public participation as risk governance: enhancing democratic accountability for agbiotech policy?" *East Asian Science, Technology and Society (EASTS): an International Journal* 1(1):19-50, (<http://www.springerlink.com/content/7wv9764lw42r7867/fulltext.pdf>)
- Levidow, Les, Susan Carr, René von Schomberg, David Wield. 1996. "Regulating agricultural biotechnology in Europe: harmonization difficulties, opportunities, dilemmas." *Science & Public Policy* 23(3):135-157.

- Levidow, Les, Susan Carr, David Wiold. 2000. "Genetically modified crops in the European Union: regulatory conflicts as precautionary opportunities." *Journal of Risk Research* 3(3):189–208.
- Lezaun, Javier and Linda Soneryd. 2006. *Government by Elicitation: Engaging Stakeholders or Listening to the Idiots?*. London: LSE CARR Discussion Paper no.34. (www.lse.ac.uk/Depts/carr)
- Marris, Claire and Pierre-Benoît Joly. 1999. "Between consensus and citizens: public participation in technology assessment in France." *Science Studies*, 12(2):3-32.
- Marris, Claire. 2001. "Swings and roundabouts: French public policy on agricultural GMOs since 1996." *Politeia* 60:22-37.
- OPECST. 1998a. *Letter from Steering Committee to participants in the preparatory weekends*, 16 April.
- 1998b. "Conférence de Citoyens Sur l'Utilisation des Organismes Génétiquement Modifiés en Agriculture et dans l'Alimentation." Paris: L'Office Parlementaire d'Évaluation des Choix Scientifiques et Technologiques (OPECST), Assemblée Nationale, (www.senat.fr/opepst/)
- Pestre, Dominique. 2008. "Participation, governance and politics today." *Science as Culture* 17:101-119.
- Popper, Karl R. 1962. *The Open Society and Its Enemies*, vol. 1. London: Routledge.
- Reynolds, Larry and Bronislaw Szerszynski. 2006. "Representing GM Nation." PATH conference, proceedings. (<http://www.macauley.ac.uk/pathconference>)
- Roqueplo, Philippe. 1996. *Entre savoir et décision, l'expertise scientifique*. Paris: INRA.
- Roy, Alexis. and Pierre-Benoît Joly. 2000. "France: broadening precautionary expertise?" *Journal of Risk Research* 3(3):247-254.
- Stirling, Andy. 2005. "Opening up or closing down? Analysis, participation and power in the social appraisal of technology." Pp. 218-231 in *Science and Citizens: Globalization and the Challenge of Engagement*, edited by M. Leach, I. Scoones and B. Wynne. Zed: London.
- 2006. "From science and society to science in society: Towards a framework for 'co-operative research.'" Report of a European Commission workshop, 24-25 November 2005, www.cipast.org, (<http://eurosfaire.prd.fr/7pc/bibliotheque/consulter.php?id=308>)
- Teknologinævnet. 1987. *Genteknologi i industri og landbrug*. Teknologinævnets Rapporter 1987/2 og 1987/4.
- 1999. *Final document of the consensus conference on genetically-modified foods*. Copenhagen: Danish Board of Technology (www.tekno.dk)
- Toft, Jesper. 1996. "Denmark: seeking a broad-based consensus on gene technology." *Science & Public Policy* 23(3):171-174.
- 2000. "Denmark, potential polarization or consensus?" *Journal of Risk Research* 3(3):227-236.
- van den Daele, Wolfgang. 1994. *Technology Assessment as a Political Experiment*. Berlin: Wissenschaftszentrum.
- 1995. "Technology assessment as a political experiment." Pp. 63-89 in *Contested Technology: Ethics, Risk and Public Debate*, edited by R. von Schomberg. Tilburg: International Centre for Human and Public Affairs
- Wakeford, Tom. (editor). 1998. *Citizen Foresight: A Tool to Enhance Democratic Policy-Making, Part 1: The Future of Food and Agriculture*. London Centre for Governance Innovation and Science and the Genetics Forum, (<http://www.ncl.ac.uk/peals/assets/publications/Citizenforesight.pdf>)
- Walls, John, Tom Horlick-Jones, Jörg Niewöhner, Tim O'Riordan. 2005. "The meta-governance of risk and new technologies: GM crops and mobile telephones." *Journal of Risk Research* 8:635-661.
- Wilsdon, James and Rebecca Willis. 2004. *See-through Science: Why public engagement needs to move upstream*. London: Demos (www.demos.co.uk)
- Wilsdon, James, Brian Wynne and Jack Stilgoe. 2005. *The Public Value of Science: or how to ensure that science really matters*. London: Demos (www.demos.co.uk)