

Converging Networks and Clashing Stories: South Africa's Agricultural Biotechnology Debate

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The debate over agricultural biotechnology in South Africa is not only polarized, but also complicated by the increasingly blurry boundaries of food governance. This was particularly apparent during the World Summit on Sustainable Development (WSSD), held in Johannesburg in August 2002. This article explores how the politics and policies surrounding genetic modification (GM) in South Africa have taken shape within a range of overlapping transnational networks of information, advocacy, regulation, and resource exchange. Drawing on fieldwork conducted before and during the summit, it examines how South African actors identify with and draw on these networks, but also express concerns and aspirations defined by more localized experiences and conditions. It observes how South Africa has come to be seen as a pivotal site for the future of GM farming and food across the whole of the African continent.

Scenes from the Summit

The World Summit on Sustainable Development, held in Johannesburg in August 2002, saw many moments of high drama. But one of the most surprising scenes took place in the cavernous convention hall of the accompanying Civil Society Global Forum, just as Vandana Shiva, one of the world's best-known opponents of genetically modified organisms (GMOs), finished speaking. In the audience, several men and women, who had earlier identified themselves as small farmers from Asia and Africa, immediately raised their hands to object to the presentation. In response, Shiva abandoned the sedate question-and-answer format and let loose a barrage of insults, refusing to hear the farmers speak. As someone who has written voluminously in support of "indigenous knowledge" and traditional agrarian economies, Shiva is the last person one would expect to disagree with the small farmers' worldview, yet during the summit, she and certain small farmers clashed repeatedly.

In the exhibition hall, the Ubongwa Farmers Union hung a hand-lettered banner reading “Vandana Shiva, don’t speak for African Farmers.” And the day before Shiva’s presentation, several hundred protestors marched in Johannesburg, claiming their “freedom to farm.” They distributed press releases that demanded “the freedom to grow any crop of their choice, the freedom to access the best available technology, and the freedom to improve agricultural productivity.” They “wanted the WSSD to respect their freedom to see for themselves the economic and technological viability of all new technologies, including agricultural biotechnology” (Mitra 2002). These “Farmers from Africa and Asia” presented Vandana Shiva with a “Bullshit Award” for “advancing policies that perpetuate poverty and hunger.”

Shiva was not the only prominent summit participant who could be accused of trying to speak for—or through—small farmers. The alternative media reported that the pro-GM small farmers’ group had in fact been sent by Monsanto, the world’s largest producer of GM seeds (Matthews 2002). At the summit, Monsanto also hosted suppers, at which pro-GM farmers from Kwa-Zulu Natal (the South African region where a substantial number of smallholders have adopted GM crops) could share their views with journalists (Pearce 2002). AfricaBio, an industry-funded, pro-GM nongovernmental organization (NGO), sponsored its own contingent of small-farmer spokespeople, among them T. J. Buthelezi, the head of the Ubongwa Farmers Union in KwaZulu Natal and a veteran on the pro-biotech public-relations circuit (AfricaBio 2002c; GMWatch.org 2004). In the anti-GM camp, meanwhile, Biowatch South Africa, an NGO run by white environmental and food safety activists, had provided a group of dancers with T-shirts proclaiming “Hands Off My Genes,” which the dancers wore over customary Zulu attire.

Genetically modified organisms did not appear on the agenda for the summit, but pro- and anti-GM activists geared up for a rowdy fight anyway. The WSSD and Civil Society Global Forum convened at a time when famine-threatened countries in southern Africa were refusing genetically modified food aid from the United States, and the United States was criticizing the European Union for imposing a “Luddite” GM stance on hungry former colonies. In this context, agrobiotechnology’s advocates and opponents worked overtime to sell their story about how GMOs would help or harm the global South, and Africa especially. And while the politicking and rhetorical performances at the summit produced no resolutions, they did illustrate two points.

First, the debate over GM in South Africa, as elsewhere, is not just extraordinarily polarized, but also complicated by increasingly blurry divisions between the traditional categories of political-economic actors. At the summit, it was not always apparent who stood for what, or who represented whom, or what authority they possessed. This blurring was often strategic—as when corporations promoted their cause via NGOs—but it also reflected much broader changes in the roles and relationships between

the public, private, and voluntary actors engaged in agro-food politics and policymaking.

Second, even though many of the summit's participants were transnational actors of one sort or another—conducting business, advocacy, research, and even policymaking across borders—the ongoing GM debate in South Africa is very much informed by the country's unique agrarian history and its increasing integration into the regional economies and scientific communities of sub-Saharan Africa.

As anthropologist Glenn Stone (2002) has observed, scientists, industry, and activists alike have tended to portray the GM revolution as one that will sweep uniformly across the global South. Pro- and anti-biotech lobbies have claimed, in other words, that the spread of GM crops will either save or starve the world's poor and hungry regions (see Council for Biotechnology Information website; Shiva, 2000, 2002). Yet as Stone's own research in India suggests, the on-the-ground effects of GM technologies will likely vary as much among countries, regions, and even localities as did the Green Revolution of the 1960s and 1970s. The variation will depend on place-specific ecologies, commercial and research infrastructures, agrarian histories, and, not least, on how the GM debate unfolds politically in different sites and at different scales. Given that many countries in Africa, Asia, and Latin America are considering adoption of GM technologies, Stone rightly identifies the need for empirical research appreciative of the diverse, geographically specific conditions in which these technologies might take root.

This paper responds to Stone's challenge through an exploration of the political-economic and normative terrain of the South African GM debate. It shows how the discourses and meanings of GM have taken shape within a range overlapping transnational networks of information, advocacy, regulation, and resource exchange, and examines how South African actors both identify with and draw on these networks, but also express concerns and aspirations defined by more localized experiences and conditions. In particular, it observes how South Africa has come to be seen across the whole of the African continent as a pivotal site for the future of GM farming and food.

This paper draws on qualitative research conducted in South Africa before and during the summit. This research was targeted and exploratory, and was not meant to be conclusive. It sought to identify the key local and transnational actors participating in the South African GM debate, and to begin to understand how these actors' roles and worldviews vis-à-vis GMOs were informed by their membership in different kinds of networks.

The article has three parts. First, we argue that any understanding of recent political struggles and regulatory processes surrounding rights to food and agrarian resources must, in Africa as elsewhere, shift the analytical focus from governments to *governance*. Second, we explain how different kinds of networks participate in such governance, and briefly characterize the main networks engaged in the governance of GMOs in

South Africa, whether through policymaking, advocacy, research, education, or the market. The rest of the paper then examines in greater depth the normative discourses, relationships, and resource flows within these networks, drawing on interviews with an assortment of participating actors. We conclude with suggestions for further research.

Food Governance Beyond Governments

The most fervent debates over GMOs in forums such as the World Summit are typically not about the scientific questions they raise but rather the *food rights*, broadly understood, that they might advance or endanger. These rights include not just the most basic “right not to starve,” but also the rights (less universally recognized or protected) of food producers to certain resources, and the rights of consumers to certain standards of quality and safety and choice. The effective and equitable protection of these rights depends partly on the official laws and policies (or what Sen calls entitlements) governing citizens’ ability to “command” food (Sen 1981). But partly—and indeed increasingly—how and whether food rights are protected depends on extragovernmental forms of governance (Rose and Miller 1992).

This became particularly apparent during the last part of the twentieth century, for two primary reasons. First, the era saw the flourishing of agro-food advocacy campaigns, aimed at defending food rights against the perceived dangers posed by globalized agribusiness. Whether focused on farmers’ intellectual property rights, organic agriculture, fair trade, or GMOs, these campaigns not only demanded government reforms, but also highlighted the capacity of other institutions—NGOs, the media, academia—to influence or even directly participate in government decision-making (Allen et al. 2003; Lang 1997; Marsden 2000). Governments in turn sought the support and counsel of these institutions in order to bolster the legitimacy of their own policies (Levidow and Marris 2001).

Second and related, the economic liberalization mandated by the World Trade Organization and the Bretton-Woods institutions required national governments, especially in the global South and the former Soviet bloc, to renounce many of the policies and programs which once assured, for example, that fertilizer and staple foods were affordable, and reserves available in the event of crop failures. This liberalization effectively shifted partial responsibility for food rights to other actors, among them the Bretton-Woods institutions themselves, as well as the NGOs contracted to deliver aid (De Waal 1997). But the security of such rights has also been influenced by the activities of transnational agro-food firms, which responded to Africa’s economic liberalization by expanding their commercial presence there, whether as suppliers of agro-inputs and processed foodstuffs, or as producers and buyers of export food commodities.

This article's discussion of corporate food governance considers only the role of the seed and agrichemical manufacturers; it is worth noting, however, that the European (and especially British) corporate supermarkets that import African foodstuffs have become increasingly influential in recent years (Barrett et al. 1999). Their stringent standards of food quality and safety, which currently ban GMOs, effectively determine which African export food producers find European markets. These retailers also expect their African suppliers to comply with on-farm "ethical" standards that may exceed in-country workplace regulations. It is unclear whether the standards have helped to protect food rights in African food-exporting regions. In Zambia, for example, their very stringency has driven more than a few horticultural enterprises out of export production altogether, costing the jobs of many of their predominantly female fieldworkers (Freidberg 2003).

What *is* clear about the partial shift in food governance authority is that more kinds of actors now participate in agro-food politics and policymaking, and more of them do so across national borders. In addition, because these actors are private or otherwise nongovernmental, the extent of their influence over food governance is not always visible and, indeed, may be purposely downplayed or disguised (Monbiot 2002). All these characteristics of twenty-first-century food governance pose novel analytical challenges for anyone seeking to understand exactly who participates in governance processes, what interests and social groups they represent, and what resource flows and ideologies inform their beliefs and actions. Yet this kind of understanding is essential as countries such as South Africa face decisions about agro-food developments that, like GMOs, have potentially enormous implications for food rights, both within and beyond their borders. The next section shows how an analytical focus on transnational networks might meet these challenges.

Networks and Stories

Among the many different bodies of social science literature on networks, two are particularly pertinent here. The first, on global advocacy and knowledge networks, examines how transnational circuits of information and idea exchange shape many different kinds of political campaigns and techno-economic developments (Keck and Sikkink 1998; Stone 2002). The second—and sometimes overlapping—literature focuses on "agro-food" networks, many of which engage in commodity production and exchange (Busch and Juska 1997; Fitzsimmons and Goodman 1998). Together, these bodies of scholarship allow us to make certain generalizations about the transnational networks engaged in food governance. The first concerns their contemporary prevalence and reach. While seeds, livestock, and agricultural technologies have long been disseminated over great distances (Carney

2001), cultural knowledge and political control over food supplies has historically been relatively local or regional. As technological innovation has speeded up and lengthened flows of information, investment, and trade, not only has a “globalized” diet become relatively banal in at least some parts of the world; in addition, it has become both feasible and necessary for food-related researchers, policymakers, and activists to seek counsel, alliances, and financial support “at a distance” (Busch and Juska 1997).

Second, networks are structurally nonhierarchical and open-ended, at least compared to many of the institutions they link, such as corporations, universities, and government agencies (Hudson 2001; Keck and Sikkink 1999). Networks can include any number and diversity of actors, as long as their behavioral norms and cultural values enable mutual comprehension (Castells 1996). Such actors in turn may belong to multiple networks, and their identities and alliances may shift over time and place. In addition, nonhuman “actants” can shape the form, reach, and dynamics of networks in many different ways (Fitzsimmons and Goodman 1998). For reasons of space, we do not explore this latter point in any depth, except to note that indigenous plant germplasm—especially, but not only that of staple food crops—has figured centrally in a great deal of scientific, commercial, and political network action around GMOs in South Africa and elsewhere on the continent. This is one point of difference between the GM debate there and the one in West Europe, where questions of food safety and quality have received more attention.

Third, precisely because networks are loosely structured and spatially dispersed, their coherence and vitality depends on the consensual discourses, or stories, created by and subscribed to by their members. Law calls such “narrative ways of telling about the world . . . what used to be, or what ought to happen,” *modes of ordering*, thus emphasizing their power to organize and mobilize (1994:20). Such stories can help to inspire and direct action, sometimes across great distances (Whatmore and Thorne 1997). In Law’s study of the Portuguese spice trade, for example, a story about *reaping a fabulous reward* unleashed a tremendous wave of technological innovation, investment, and labor recruitment, which eventually enabled European monarchs to influence geopolitics and resource extraction halfway around the globe (Law 1986). In the South African GMO debate, stories about how agro-biotechnology might help the worlds’ small farmers reap a fabulous reward—or, alternatively, how it might ruin them—have fueled a wide array of networked initiatives to support or resist the advance of the technology. Such stories are rooted in basic normative beliefs about what, for instance, constitutes technological “progress,” or valid scientific knowledge, or acceptable forms of risk. To actors outside the networks that created them, they may not seem compelling, or even rational.

The fourth point about such networks (which partially qualifies the previous two) is that some actors obviously have much greater power than others to create and tell stories. They can use this power not only to control and reinforce the loyalty of a network’s existing members, but also to recruit

others. In the case of the spice trade, the promise of fantastic wealth helped European royalty and mercantile interests to enlist into their networks diverse and useful actors, such as financiers, mapmakers, and navigators. In the case of the biotech industry, generous funding of government and university research has helped it to win expert support and collaboration, just as its development and promotion of “pro-poor” GM technologies, such as the beta carotene-enhanced Golden Rice has won endorsements from organizations such as the United Nations Development Program (UNDP 2001).

An important part of this storytelling power lies in the capacity to downplay or obscure information that might discredit the overall narrative. Sometimes this information concerns risk; the story of fantastic New World wealth did not tell sailors about the journey’s potentially fatal dangers. Sometimes such information concerns alternatives; in and beyond South Africa, the biotechnology industry’s PR about fighting hunger with high-yielding GM crops does not mention either other methods for increasing yields or, more importantly, other explanations for hunger (i.e., inequitable food distribution, rather than absolute scarcity). Sometimes, stories are told in ways that obscure their sources, as when multinational corporations have paid small farmers and church groups to demonstrate in favor of GM, or invented “fake citizens” to argue their case on line (Matthews 2003; Monbiot 2002; Peterson 1999; Teerpu 2002).

Last, any analysis of how transnational networks are shaping food governance must appreciate how they converge at particular times, in particular places, and within particular institutions. In other words, networks of information exchange, advocacy, investment, and so forth may be increasingly untrammled by distance or territorial borders, but their actions and interactions ultimately take place somewhere. How, then, do their stories take on and transform the localized cultural and political-economic conditions of food governance?

The rest of the article asks this question of four different, albeit overlapping networks, which participate in the governance of GMOs in South Africa. First, we briefly describe each network, and the particular roles the networks have played in South Africa. Then we examine how, in and beyond the summit, scientists, policymakers, activists, and corporate managers invoked hopes and concerns that spoke both to their membership in different networks and to South Africa’s history and relations with the rest of the continent.

The Scientific Network

The members of this network are typically life scientists by training, employed in universities, public research agencies, or private research-and-development firms. They conduct research on or related to GMOs, and form what Diane Stone (2002) defines as an “epistemic” network. As networks go, theirs is exclusive and prescriptive (Murdoch 1998). Membership presumes

the possession of certain kinds of codified knowledge and vocabularies, and belief in the validity of scientific methods of inquiry and explanation (Stone 2002:4). Even if members of this network do not by themselves possess official regulatory authority, they may seek or be asked to contribute their scientific expertise to debates and review processes that ultimately shape biotechnology policy. More generally, they influence the governance of GMOs by formulating and seeking support for particular research priorities. Their professional status gives them privileged access to global repositories of scientific knowledge, as well as to national and international funding sources. Indeed, because their research often depends on extramural funding, they must be able to communicate its relevance—i.e., what it means for policy or profits—to corporations, foundations, and government bureaucracies. Whether members of this network communicate effectively with the public is another matter. Certainly, they now often attribute public fears of GMOs to what they see as inaccurate or distorted media coverage (Wynne 2001).

In South Africa, the biotech scientific network links researchers in universities, technikons (technical colleges), and the state-funded Agricultural Research Council (ARC) and Council for Scientific and Industrial Research (CSIR) with university and public sector scientists throughout the world, as well as with researchers in large and small biotech firms. The importance of these linkages is varied and changing. South African bioscientists have traditionally looked to Europe and to a lesser extent North America for funding and research partnerships; some claim, however, that scientists in these regions, fearing competition from their South African counterparts in the lucrative field of GMO patent development, have offered little assistance.

Since the fall of apartheid, collaboration and communication with scientists at other African universities and public institutions, such as the Nigeria-based International Institute of Tropical Agriculture, has influenced the South African biotech sector's own research agenda, at least as described by the researchers themselves. They describe how advances in agro-biotechnology, especially in the realm of drought-, pest-, and virus-resistant crops, might benefit farmers and consumers across the whole of Africa. Of course, whether or not this actually happens depends on resources and political will.

The Policy Network

This network plays the most formal role in the governance of GM technologies in South Africa. Many of its members do, in fact, work for one of the government bodies involved in developing and implementing GMO policy. For food and agricultural biotechnology, the National Department of Agriculture is arguably the single most important regulatory agency, because it decides on the permits granted for field trials and commercial releases of GM crops. But all applications for permits are reviewed by a committee of

academics (one of the several points of overlap between the scientific and policy networks), as well as by a council representing the Departments of Agriculture, Environmental Affairs and Tourism, Trade and Industry, and Health (Aerni 2002:7, 12).

South Africa ratified the Cartagena Protocol on Biosafety in November 2003, thereby signaling that its GM licensing decisions would take a precautionary approach toward biodiversity protection. Two months later, the Department of Health published the country's first GM food-labeling regulations, which required a GM product to be identified as such only "if its composition, nutritional value, or mode of storage or cooking is significantly different from conventional food," or if the product contained an allergen. Foods containing GM maize and soy, the only two GM food crops licensed for production in South Africa itself, would not require labeling (Department of Health 2004; Kahn 2004).

In theory, policy networks extend into not only academia, but also domestic civil society institutions such as the popular media and the policy-oriented voluntary sector (D. Stone 2002). In practice, South Africa's GM policymakers have been more influenced by other governments' regulatory precedents, as we discuss again below. The question is whether such models are suited to postapartheid South Africa, where the disparities in land ownership and resource access between black and white farmers remain large and politically sensitive. In addition, the fact that much of the population obtains food and farm inputs through informal channels poses even greater practical problems for regulating GM distribution than those already observed in the United States.

The Advocacy Network

Of all the networks participating in the governance of GMOs in South Africa, the one linking anti-GM activists across Africa and the world relies most openly on beliefs and values to bind its diverse and far-flung members. Often excluded from (or at least marginalized within) official policymaking forums, transnational advocacy networks "must use the power of their information, ideas and strategies" to influence government and corporate decisionmakers, either directly and/or by way of public opinion (Keck and Sikkink 1999:95). Although NGOs within these networks often sponsor their own research, their perceived moral authority typically carries at least as much weight as their scientific claims. The most prominent groups in the South African anti-GM community are Biowatch SA, the South African Freeze Alliance on Genetic Engineering (SAFeAGE), and Earthlife Africa, a branch chapter of Friends of the Earth (FoE). All these groups receive information, advice and other support from international organizations such as FoE, Third World Network, Greenpeace, and Consumers International. At home, the predominantly white leaders of the anti-GM groups still struggle, like the environmental movement more broadly, to build support among the country's black citizens, who have long associated environmentalism

with the racist conservation policies of the apartheid era (Aerni 2002:7; but see Koch 1991).

Although most of the contemporary literature on “advocacy” NGOs and networks focuses on those that seek to rein in corporate power, it is worth noting that corporations often sponsor and even create their own NGOs. As the next section describes, such groups’ efforts to participate in the Johannesburg Summit as NGOs set off disagreements about the often-fuzzy line between business and civil society.

The Production Network

Unlike the previous three networks, this one focuses on the dissemination and exchange of the GMOs themselves. Its members are the most explicitly concerned with the bottom line, whether that means corporate share prices or the revenue earned from the family farm’s seasonal harvest. That said, members of this network are obviously very much influenced by, and often participate in, the governance activities of the research, policy and advocacy networks.

In South Africa, multinational seed and chemical companies, such as Monsanto, Aventis, Syngenta, and Pioneer Hi-Bred International, are the most aggressive promoters of GM crops. Of the 147 applications that the National Department of Agriculture in 2001–2003 received for GM field trials or commercial release (as opposed to commodity import or export), 126 came from foreign firms; the remaining 21 came from South African companies (such as Pannar Seed), universities, or research institutions (National Department of Agriculture 2001–2003). In turn, large-scale commercial farmers produce almost all GM maize and soybeans in South Africa and, in 2002, 95 percent of the GM cotton. The biotechnology industry’s efforts to promote small-scale GM production have born the most fruit in the Makhatini Flats region, where an estimated three to four thousand smallholders cultivated GM cotton in 2002 (Beyers et al., 2002; Ismael, Bennet, and Morse 2001; Kirsten, Gouse, and Jenkins 2002). The same year, however, the government approved the commercial release of a GM variety of white corn (South Africa’s staple grain), raising the prospect of more widespread GM crop adoption among smallholders (Biowatch 2002; Kanuma 2002).

The Actors

Although a diverse range of networks are now actively studying, promoting, policing and resisting GMOs in South Africa—and increasingly across the continent—the debate about how they should be regulated is far from over. To understand how these networks might influence the future of GMO governance in and beyond South Africa, we need to scale down one level. The next section examines the roles and opinions of individual participants

in the GM debate as it played out in and around the 2002 Johannesburg Summit. It is worth emphasizing that these individuals do not necessarily represent “typical” members of their networks, but their perspectives do reflect certain concerns and assumptions.

A Public Sector Scientist: The Biochemist

A biochemist by training, she began research on plant genetic modification in the early 1990s, and now works for CSIR. She and her colleagues conduct research on cereal-crop transgenics, molecular farming, plant-tissue culture, industrial-microbe transgenics, and gene mining of South African plant resources. Their clients include the government and both South African and foreign firms. Indeed, because the government provides for only 40 percent of the CSIR budget, contracts from the private sector are essential. The Biochemist currently directs CSIR’s and the University of Pretoria’s joint initiative to create a high-profile research center aimed at developing patented GM products for the international market. To determine what the market might want from South Africa’s biotechnology research and development, the CSIR scientists tap transnational networks of information and research collaboration. The Biochemist, for example, has research partners in Europe and North America, as well as contacts at universities across Africa.

The CSIR scientists also rely on overseas foundation support. But many foundation grants stipulate that research must benefit “the poor of Africa,” as the Biochemist puts it, and that poses problems for scientists in Africa who must raise much of the money needed “to keep bodies on seats” in public sector research agencies. “Unfortunately,” she says:

We are not here as a charity organization. We don’t have the freedom just to use our money to benefit somebody else with nothing coming back to us, because we have to be a self-sustaining organization at the end of the day. That’s not going to happen unless we can get some kind of financial reward from the things we invest in.

Like many of the actors interviewed, the Biochemist was acutely aware of how longstanding North-South inequities constrained advances in African science and technology, albeit sometimes in subtle ways:

In many cases, we find that international funding agencies don’t necessarily want to invest in something that could potentially bring the developing world up to a level where they could actually compete with the developed world. We get that impression. A lot of it is like, let’s give funding to the poor of Africa so we can salve our consciences, but not so that they can come back and bite us in a few years’ time.

Yet the Biochemist contends that South Africa's biotech sector could and should be "globally competitive," a view in line with the government's National Biotechnology Strategy (South Africa 2001). In keeping with this goal, proposed research projects must be assessed carefully, to determine:

what's the potential for profit, what's the potential for entering global marketplaces, for social upliftment in South Africa or the rest of Africa. You can't always get a positive answer for all of those, but the answer must be reasonable to some of those things. And at the same time, it must be in line with the technology base that we are trying to build.

As a public-sector GM researcher, the Biochemist must manage resources carefully, even entrepreneurially. But she dons the hat of the scientist when talking about the controversies surrounding GM technology. Scientists, she says, bring "realism" to the highly politicized South African debate, and should "speak on behalf of what science is all about." While she willingly discusses GM agriculture's possible risks (a willingness not shared by all her peers), the risks she mentions are predominantly ecological. She expresses concern, for example, about the possibility that pests might develop resistance to inserted genes, "particularly in the small-farmer situation," where fallow land is too scarce for planting non-GM "refugia" (the method the seed companies recommend for preventing pest resistance). As we shall see, opponents of GM crops in South Africa perceive a quite different set of risks.

The Biochemist believes such opponents are misinformed, and puts part of the blame on the scientists who "don't actually know how to put the message across properly," and end up as "sitting targets" for unfavorable media coverage. She and her peers would like to see not only public educational campaigns, but also courses to train scientists to communicate with the media. During the summit, in fact, CSIR hosted a roundtable discussion on the topic of science communication (Mnisi 2002).

The Microbiology Professor

Her university laboratory is set high on a hill, but more than twenty-five years of research on GM crops has taken the Professor well beyond the ivory tower. While many scientists, as the Biochemist put it, "just want to be left alone to get on with their work," the Professor seeks to shape public and political opinion, both at home and abroad. She has given talks on GM agriculture everywhere from local women's clubs to the annual World Economic Forum. Alongside fellow academics and industry representatives, she sits on the boards of pro-biotechnology NGOs, such as the International Service for the Acquisition of Agri-Biotech Applications (based in Kenya and the Philippines) and AfricaBio (profiled later). In pro-biotech publications distributed at the summit, her name appeared alongside those of

Monsanto, the Biotechnology Industry Organization, and the Competitive Enterprise Institute, an industry lobby group promoting deregulation. Not least, she was one of ten people (nearly all of them scientists) who wrote the government's *National Biotechnology Strategy for South Africa* in 2001. The report's top recommendations included the creation of regional biotechnology "innovation centers," which would draw on academic expertise, but would above all focus on "the creation of economic growth and employment through innovation" (South Africa 2001:ii).

For all her connections to multinational biotechnology enterprise, the Professor's own research centers on drought- and virus-resistant crops suited to African agro-ecology—the kinds of innovations that industry has historically found less interesting than, say, pesticide-resistant crops for northern-hemisphere climes. But as a South Africa-based, Rockefeller-funded scientist, she is seen as an authority on how and why the continent needs agro-biotechnology. As she said during one of her World Economic Forum speeches:

Don't throw out GM food just because Europe and America don't want it. You don't need GM crops in the developed world, but we are desperate for them! . . . Africa does not have the money to buy huge supplies of food, and thus has to focus inwardly for the supply of food. Africa needs to design crops that would be drought resistant, virus resistant, fungus resistant, and that contained vaccines.

For her, the virtues of such crops are so apparent that she has little patience for those who raise questions about their potential risks. Referring to an article that had appeared recently in the South Africa press, she said, "When people who aren't microbiologists talk about antibiotic resistance, it makes me mad. I said to the person who wrote that article: all scientists aren't equal, and I'm a microbiologist, and I know what I'm talking about."

The Policymakers

The two women, the older one white and the younger one black, work for the South African Department of Health's (DoH) Food Control Division. Both food scientists by training, they have helped to develop the country's policy on GMO labeling. Compared to policymakers in Europe, they have yet to encounter much popular opposition to GMOs. Nonetheless, they are wary of the activists who, in their view, seek to stir up such opposition through sensationalist media tactics; the older woman says she will not grant an interview to Greenpeace.

The Policymakers agree that despite increasing media attention to the GMO debate, few South Africans know or care much about the issue. The older woman says that people don't understand the basic concept of genetic modification; "just to find a word in the native language to explain

biotechnology is already very hard.” The younger woman, meanwhile, blames the AIDS crisis for the public’s seeming lack of concern about GMOs: “no one has died yet from eating GM food, unlike AIDS, where they see people dying all the time.”

Faced with relatively little pressure to involve the public in decisions about GM labeling, the Policymakers focused instead on the guidance provided by other members of the transnational scientific and policy networks. After consulting sources ranging from Codex Alimentarius (the WTO’s food-standards body) to the scientific literature (*Food Chemical Review*) to personal contacts in academia, both in South Africa and abroad, they and their DoH colleagues recommended, as of 2002, a voluntary labeling policy like that of the United States. This would give producers the option to label their goods as “Non-GM Foods” or “Genetically Enhanced or Improved.”

The Policymakers contended that a stricter policy, such as the mandatory labeling preferred by the EU, would be prohibitively expensive, arguably impossible to apply to the enormous volume of food sold through informal channels, and meaningless to the country’s illiterate consumers. “How do you label the corn of the guy boiling mealie on the street?” the older Policymaker asked rhetorically. In any case, she added, “I think our population, our consumers, should really trust government on this. We won’t let them have something that isn’t safe. Never. We are very, very responsible.”

It turned out that neither GM opponents or proponents were pleased with government when it finally published the January 2004 GM labeling law described earlier. Although a DoH representative said the decision to require labeling only when genetic modification made a food “significantly different” sought to “balance the consumer’s right to know against peoples’ rights to affordable food,” SAFeAGE accused the government of compromising “to suit industry and not the consumer” (Kahn 2004). For its part, the pro-biotech AfricaBio claimed that the law “could open the floodgates for fraudulent labeling,” because it did regulate the use of the terms “non-GM” or “GM-free.” The group also criticized the government for passing the legislation without consulting it or other “biotechnology stakeholders” (AfricaBio 2004b.)

The Monsanto Middle Manager

He studied entomology, but much of his work for the world’s largest biotechnology company requires other kinds of skills. Monsanto, after all, has run up against popular and government opposition in Europe and South Asia, and the company’s Johannesburg office (one of ten nationwide) hopes that good outreach—especially to small farmers—will avert similar hostilities in South Africa. The company therefore engages actively in extension; its foundation, the Monsanto Fund, also supports initiatives such as the Buhle Farmers’ Academy, a training school for small-scale farmers (Monsanto 2002). Ultimately, the company hopes that South African farmers’ adoption

of GMOs will open doors and win business across the rest of the continent. And for this manager, the business of a multinational corporation selling peasant farmers GM seeds is not different from any other:

What in the world is not reliant on big corporations? Look at the clothes you are wearing. How did you get here? An airplane, a corporation. Everything we do. So there's nothing new. That's what drives the world . . . If I'm a farmer in K-N and if I use this seed as opposed to what I am currently using, there's going to be something extra out of this for me. It's his choice. At the end of the day, why do the world's airlines buy Boeing? Because Boeing delivers a product that they perceive as reliable, cost-efficient, does something for them. It's exactly the same thing with GMOs.

He has little patience for GM's opponents, who he says do not have small farmers' interests in mind:

Is the world really saying to the small scale farmer, "you, your children and everybody after you, we're not going to help you and you're not going to help yourself so you can sit there quietly working on your patch every year and your kids won't get educated, etc, etc., and if you want to do that, that's great"? That's what the world is saying.

For the representative of the biotech industry to make these points is hardly surprising. But the Manager veers somewhat from the company line when, like the scientists and indeed some of the anti-GM activists, he invokes economic nationalism:

I passionately feel that South Africa has in its hands here unbelievable technology and I don't see why it has to be a company in America that has to make money off of our technology.

—But isn't Monsanto an American company?

Yeah, I work for them, but I'm South African. My feeling is that with the beauty of what we have here, why don't we go and do our own prospecting, do our own analysis and when we've analyzed it, . . . we say, this is what we are going to patent. And then with our own pharmaceutical companies, start selling it to the rest of the world. I mean I have to pay a hell of a lot of money to an American company for my medication. I think it would be nice to have it the other way around for a change.

The Activist

He is a volunteer spokesperson for SAFeAGE, a South African NGO that seeks a five-year moratorium on the commercial production and trade of GMOs, and on the patenting of genetic resources. This campaign goal has proven tougher than an earlier one to get GM food off the shelves of the country's supermarkets, which were eager to please their affluent customer base. Woolworth's, for example, agreed almost immediately to activists' appeals in 1999. "We just spoke to them in a quiet, logical way and said it is what the customers wanted. They were thinking of going that way anyway and we probably tipped them over."

The Activist draws a sharp distinction between biotechnology and its subfield of "genetic engineering," in which corporate science forces its agenda while obscuring or foregoing health and environmental risk studies:

We support most biotechnology but disagree with the science and tendencies behind transgenic crops, especially the ones used that presently advantage mainly the producers of specific traits, usually tied to chemical selections. And the science regarding health and environmental safety of these crops, including crops already planted is categorically lacking. If [assessments] do exist, they are not in the realm of peer-reviewed literature, hence they do not exist in the reality of accepted scientific practice.

Like many of the global South-based NGOs in the anti-GM advocacy network, SAFeAGE rejects the argument that, as the Activist puts it, "green biotechnology is going to save the world." Again, the opposition reflects a fundamental distrust of corporate initiatives:

Absolute greenwash. It's nonsense. And it's all a part of this whole corporate drive, this public-private partnerships being promoted in the WSSD. "Oh, the corporations are going to help you feed Africa." Nonsense. They're going to help you bleed Africa, not feed Africa. . . . Farmers are promised the world to be made dependent on their high external input systems. Exactly the wrong direction for South Africa and other indebted nations.

Even at the R-and-D stage, the activist points out, biotechnology has cost African nations dearly, while generating few returns. Kenyan research on a virus-resistant sweet potato, he noted, "has taken over U.S.\$6 million and the expertise of at least six Ph.D.s, and has not yet got anything approaching a marketable product," in part because the potato is not a popular eating variety. Traditional plant breeding and integrated farming practices, he

argues, have produced equally good or better results, at a fraction of the R-and-D cost.

As mentioned earlier, many NGOs in the advocacy network are better known for making moral rather than scientific arguments, even if, like SAFeAGE, they collect and publicize scientific information. Biotechnology's advocates have not hesitated to portray the NGOs' stance as irrational and "emotional," a charge the Activist resents:

Look, we know what we are talking about, we're not emotional, and we're not over the top. Monsanto has had very direct influence with government, and they've said, "You know we'd love to debate this but, oh the NGOs are emotional." We're not. We'd really like to get down to the nitty-gritty.

But who is "we"? A handful of volunteers run SAFeAGE; Biowatch South Africa and Earthlife Africa are larger, but none of them has nearly the kind of domestic grassroots base or brand-name recognition enjoyed by their NGO counterparts in the global North. They do, however, wield a kind of virtual clout. SAFeAGE's online GM moratorium manifesto has collected 500,000 signatures (250,000 from within South Africa). The organization acts as "a clearinghouse for information and data," which it shares with more than one hundred South African advocacy organizations, plus more than 60 groups overseas. Yet if one of the advocacy network's main purposes is to disseminate information that will gain support for the cause, the Activist emphasizes that the people his group seeks to protect—South Africa's small farmers—have made up their own minds about GM. At the Civil Society Global Forum's Biotechnology and GMO Commission, he said, "You can listen to the real African farmers, not the guys who are dependent on Monsanto, but you come here this afternoon and listen to the real African farmers and find out they worked out their position on their own. We've had no input into this."

The Excluded NGO

AfricaBio describes itself as a nonprofit, nonpolitical biotechnology stakeholders association. South Africa's anti-GM activists describe it as an industry support group. Either way, it participates in almost every realm of GMO governance in South Africa, from R and D to regulation and public education. AfricaBio is widely quoted in popular press coverage of the GM debate (Brummer 2001; Le Page 2000; McClelland 2003; Planting 2002), and unlike environmental NGOs, enjoys access to policymaking circles. In August 2002, for example, it was invited to organize an educational seminar on biotechnology for the South African Parliament.

AfricaBio also participates in a transnational advocacy network, whose members include Africa-based pro-biotech organizations such as the

International Service for the Acquisition of Agri-Biotechnology Applications (ISAAA) and the African Biotechnology Stakeholders Forum (ABSF). The stories that AfricaBio tells about GM highlight Africa's urgent need for new food-producing technology:

Food production in most African countries is one of the lowest in the world i.e. an average of 2,5 tons/ha vs. a US grower average of 9,0 tons/ha. Africa to a large extent missed the Industrial, Green and Information Technology revolutions—it can't afford to miss out on what Genetic Modification has to offer! (AfricaBio 2002b)

As many as one third of the children in sub [*sic*] Saharan Africa are said to be stunted because of poor diet, while every day thousands of people die from hunger. . . . A further tragedy is that millions of people are forced to live below their full potential because they lack the energy and good health to function at their best. Access to existing and new technologies in agriculture is clearly a high priority in Africa. Biotechnology is one of the new technologies that has a significant role to play in improving crop production and reducing waste. (Africabio 2004a)

At the Civil Society Forum's GMO and Biotechnology Commission, AfricaBio was not granted a place on the panel alongside activists such as Vandana Shiva. In response, it distributed press releases at the World Summit "on behalf of the excluded NGOs" and the small farmers they claim to represent:

NGOs supporting biotechnology have been deliberately excluded from the programs. . . . Farmers (attending the programs) from Africa, China, Philippines, Mexico[,] and India testified as to their personal positive experiences with growing GM crops. . . . These farmers were rudely abused by Ms. Vandana Shiva, and their views were entirely dismissed by the panel. Fair representation of stakeholders within the NGO Major Group is required, including farmer representatives from developing nations so that the interests of small farmers are fully taken into account.

Yet AfricaBio's resources nonetheless enabled it to participate in the summit and related events. Besides sponsoring the attendance of pro-GM farmers, as mentioned earlier, it submitted a report on biotechnology in South Africa to the WSSD Preparatory Meeting (AfricaBio 2002a). And during the summit itself, it sponsored a daylong panel on "Biotechnology and Biodiversity in Sustainable Development" at the associated "Science at the Summit" event.

The Small Farmer

The Farmer hails from Kenya, where he grows vegetables for a living. He came to Johannesburg to attend the Small Farmer Convergence, which was organized by the Zimbabwe-based Participatory Ecological Land Use Management (PELUM) Association to coincide with the WSSD Summit. Along with a few hundred other self-defined small farmers, most of them from east and southern Africa, he caravanned to Johannesburg from Lusaka, and took part in a variety of NGO-sponsored educational forums. Some of these forums focused on tactics for helping the farmers, as PELUM put it, “speak for themselves” at the summit; others provided information about specific issues, among them GMOs. Whether or not he knew or cared much about genetic engineering before arriving at the summit, he now firmly opposes it. He mentions possible health and environmental dangers, but most opposes corporate ownership of seeds: “They’re patented, and there’s no regeneration, and so it means it belongs to somebody. . . . We don’t always want to look for seeds from some commercial enterprise.”

It is impossible to assess whether the Farmer’s views on GMOs represent Kenyan, much less “African” small farmer opinion more generally. Simply the fact that he was chosen and able to participate in the convergence (PELUM required that all delegates belong to small farmers’ organizations) suggests that he has enjoyed access to high levels of information and organizational support.

It does seem safe to say that the Farmer and other PELUM delegates did not come all the way to Johannesburg only or even primarily to protest genetic engineering. As PELUM itself emphasized, the larger point of the convergence was simply to give small farmers an opportunity to “speak by themselves” at a forum where many kinds of powerful institutions would attempt to speak for them. As the Farmer explained,

And we have composed here primarily because we want to share and have a visibility into the future so that our governments can listen to our pleas. We have to have access to markets, we have to have access to decision making. You see when our governments decide on our agricultural sectors, we have to have a say . . . because we are the people in the field who know exactly the experience of the field.

Despite his confidence in his own agricultural knowledge, the Farmer had spent enough time in the company of anti-GM activists to share their suspicions of the biotech industry’s representatives at the summit:

I wouldn’t want to think about [those people over there who are trying to push biotechnology], to listen to them. Because I know they will try to sweet-talk me into some position that I won’t be able to extract myself from.

Conclusion

Amid the many disagreements apparent in and beyond the summit—not just over the benefits or risks of GMOs themselves, but also over who did, or should be able to, represent whom—a few points, at least, were clear. First, actors' views of GMOs and of each other were very much shaped by their membership in different kinds of transnational networks. Drawing on different “stories” about the problems that GMOs might solve or create, they did not always even agree on the basic terms of debate. At the same time, however, most actors appreciated the specific significance of GM agriculture for South Africa, a country where apartheid's legacies still define landscapes of food production and consumption. They also appreciated the converse: South Africa's governance of GMOs would likely have ripple effects across the whole of the continent.

It was also clear that all sides saw the archetypal “small farmer” as a critical ally. The battle for the hearts and minds of Africa's small-scale food producers has, at best, motivated biotech R and D that may eventually bring some small farmers genuine benefits; at worst, it has generated a fair amount of costly and cynical PR. At the least, it signals the need for in-depth, qualitative research in agrarian regions where neither policymakers nor scientists understand much about the social relations and cultural norms that would shape the conditions for biotechnology adoption.

In addition, it was clear that even less effort has gone into understanding and drawing on the views of Africa's *consumers*—meaning here those people who depend on the market for at least part of their food. This is despite the fact that their numbers are already significant in South Africa and increasing, apace with urbanization, across the rest of the continent. Only the most elite consumers command much voice, and only in places where retailers such as Woolworth's have found it in their own self-interest to listen to them. It has long been assumed (and not only in South Africa) that poor consumers worry about the quantity of their food more than its quality or safety. But again, this assumption warrants empirical research, because so far almost none exists (though see Sanogo and Masters 2002).

Finally, it was clear that even though South Africa's citizens are being asked to “trust government” to keep their best interests in mind when making decisions about GMOs, such decisions are in fact influenced by networks of relations—and the resources and stories they mobilize—that extend well beyond the walls of government and indeed beyond the borders of South Africa. Further inquiry into how such networks are blurring the traditional institutional and territorial boundaries of food governance would help to illuminate not simply the GM debate in South Africa, but the future of food rights in Africa more generally.

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