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FORMAL AND INFORMAL GOVERNANCE OF AGRICULTURAL BIOTECHNOLOGY IN KENYA: PARTICIPATION AND ACCOUNTABILITY IN CONTROVERSY SURROUNDING THE DRAFT BIOSAFETY BILL

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Abstract: Formal governance of agricultural biotechnology in Kenya—i.e. national institutional and policy developments—has been loosely co-ordinated and largely reactive, both in terms of bio-safety and in terms of setting national priorities. At the same time, modern biotechnology developments have been occurring for over a decade, mainly driven by public-private partnerships. Governance of biotechnology has thus been largely informal with strategic decisions being made mainly outside state mechanisms. The distinction between formal and informal governance sheds light on the current draft biosafety bill of Kenya and how it is pivotal for tipping biotechnology developments more towards increased accountability and open participation of farmers and publics. The government of Kenya, non-governmental actors and donors must all make actions to shape a more productive interaction between formal and informal governance to avoid immediate and long-term repercussions.

1 INTRODUCTION

Kenya has become a biotechnology role model. Donors and many analysts hold Kenya up as an exemplar of agricultural biotechnology development, and of the development of biosafety systems (see, for example, Traynor and Macharia, 2003; Thomson, 2004). Indeed, Kenya is the hub of agricultural biotechnology development in East Africa and all of sub-Saharan Africa (except South Africa). The development of modern biotechnologies has been occurring in Kenya for over a decade, mainly driven by partnerships between public and private sector actors.

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Whether or not one considers Kenya to be such an exemplar, more attention should surely be given to how decision-making surrounding biotechnology takes place there. This paper makes a step in that direction. The paper builds on the many recent studies that have been conducted, detailing institutional and technological developments in Kenya (Quemada *et al.*, 2002; Wekundah and Kabere, 2002; Odame *et al.*, 2003a; 2003b; Traynor and Macharia, 2003; Wakhungu and Wafula, 2004). It draws out some implications for decision-making and governance from these studies. I argue that introducing a distinction between formal and informal governance helps illuminate how strategic decisions are made, who is participating in them and who is accountable for them. Primary empirical research[1] concerning the draft biosafety bill in Kenya is examined in this light.

The rest of the paper is divided into five sections. In the next section background information is presented about Kenyan biotechnology and biosafety developments. In section three the concepts of formal and informal governance are framed and introduced. This distinction is used as a lens to critique biotechnology and biosafety developments in Kenya in the fourth section. I argue that formal governance of agricultural biotechnology in Kenya—i.e. national institutional and policy developments—has been loosely co-ordinated and largely reactive, both in terms of biosafety and in terms of setting national priorities. Governance of biotechnology has thus been largely informal with strategic decisions being made mainly outwith state mechanisms. The critique highlights the importance of the current biosafety bill in Kenya as a fulcrum for increased accountability and participation. Current developments surrounding this bill are examined in the fifth section as the main case study in this paper. Policy recommendations and implications are addressed in the conclusion. The case study shows that unless changes are made, the Kenyan government and non-governmental actors are missing an opportunity to shape a more productive interaction between formal and informal governance and swing the political balance back towards transparency and inclusion. This not only has immediate implications, but could have longer term and lasting impacts based on previous experiences in Europe.

2 AGRICULTURAL BIOTECHNOLOGY AND BIOSAFETY IN KENYA

Kenya has been engaging with 'low'[2] biotechnologies, such as bio-fertilizers and tissue culture for several decades (Odame *et al.*, 2003a). Tissue culture continues to be an important technology in Kenya in the horticulture sector particularly in citrus and pyrethrum. More recently there has been immense focus on tissue culture in bananas (see for instance, Wambugu and Kiome, 2001).

The first 'modern'[3] biotechnology to be developed in Kenya was a genetically modified (GM), virus-resistant (VR) sweet potato. This project began in 1991 and was a public–private partnership between the Unites States Agency for International Development (USAID), the Kenyan Agricultural Research Institute (KARI) and the Monsanto Company. The International Service for the Acquisition and Application of Agricultural

[1]Research for this case study was conducted by the author in Kenya in April 2004, and from October 2004 to January 2005. Qualitative semi-structured interviews were carried out with public and private sector actors. All information from these interviews is cited as personal communication.
[2]The term 'low' here is used to denote biotechnologies which do not involve any genetic modification or recombination.
[3]The term 'modern' is used to denote biotechnologies which do involve genetic modification.

Biotechnology (ISAAA) officially joined the project in 1999 (M. Karembu, personal communication, April 2004). Recently, the ARC–Roodeplaat Vegetable and Ornamental Plant Institute (VOPI) of South Africa, another public sector institute, became a member of the project along with the Danforth Plant Science Center in the USA (Horsch and Montgomery, 2004). Much has been written about this project in the academic literature and the international media, as it was the first attempt to develop and cultivate a GM crop in East Africa (see, for example, Quaim, 1999; Wambugu and Kiome, 2001; Odame *et al.*, 2003a; *New Scientist*, 2004). Recent reporting in Kenyan and international media has focused on results of contained field trials that showed the failure of the VR potato to protect against viruses (Gathura, 2004; *New Scientist*, 2004). Despite the general failure of these trials, the project is still ongoing and new modifications of sweet potato are being researched and developed (Horsch and Montgomery, 2004).

Several other GM crops have recently begun to be developed in Kenya via partnership mechanisms. KARI is a main public partner in all of these projects and most financial support comes from the international private sector and international donors. It should be made clear that none of these projects have led to the commercial cultivation of GM crops in Kenya. No GM crops have moved beyond contained trials. Table 1 details current modern biotechnology projects and partner organizations.

Biosafety and regulatory developments in Kenya have been taking place concurrently with biotechnology development. Like the development of specific biotechnologies, the development of biosafety systems has mainly been sponsored by several major donor projects. The timeline in Table 2 gives an overview of the interaction between technology and regulatory developments and the donors that have sponsored each.

Table 1. Current agricultural modern biotechnology projects in Kenya

Product	Year of approval(s)[a]	Main partners
Recombinant livestock vaccines (for diseases such as rinderpest and capripox)	1995 (*ad-hoc*)[b]	KARI, Pirbright (UK), University of California, Davis
Virus-resistant sweet potato	1998	KARI, Monsanto, USAID, ISAAA, ARC-VOPI, Danforth Center (USA)
Insect-resistant (Bt) maize	2001 leaves 2003 seeds	KARI, CIMMYT,[c] Syngenta Foundation, Rockefeller Foundation
Insect-resistant (Bt) cotton	2003	KARI, Monsanto
Virus-resistant cassava	2003	KARI, Danforth Center (USA) USAID (ABSP II)[d]

Adapted and updated from M. Bolo (personal communication, August 2004).

Notes:

[a]Approval here refers to the year that the products were approved for importation by the Kenyan regulatory system discussed below.

[b]There have been several recombinant animal vaccines that have been developed by Kenya and international partners. The first of which (a rinderpest vaccine) received ad-hoc approval for importation by the Department of Veterinary Services in 1995. This approval came before the formation of the national biosafety guidelines and the National Biosafety Committee in 1998 (Traynor and Macharia, 2003). The biosafety guidelines are discussed more below.

[c]CIMMYT is the International Maize and Wheat Improvement Center headquartered in Mexico.

[d]The Agricultural Biotechnology Support Program Part II is a five-year, $34 million USAID program to 'complement regional and country efforts to develop and commercialize genetically modified (GM) crops' (ABSP II, 2005). ABSP is discussed more below.

Table 2. Kenyan agricultural biotechnology and biosafety timeline

1960s	—	Kenya Farmers Association imports biological nitrogen fixation fertilisers (a traditional biotechnology)
	—	Rinderpest vaccine was produced by the East African Veterinary Research Organisation
1970s	—	Systematic decision made to invest in ag-biotech at U. of Nairobi, to replace chemical fertilisers
1980s	—	Tissue culture technologies begin in pyrethrum and citrus (KARI and University of Nairobi)
1990	—	Government appointed National Committee on Biotechnology Advances and their Applications initiates evaluation of biotechnology
1991	T	Virus-resistant sweet potato project starts. Partners include: USAID (ABSP), Monsanto, KARI and later ISAAA
1993	S	DGIS—Netherlands program starts and founds the Kenyan Agricultural Biotechnology Platform (KABP)
1994	—	ISAAA Afri-centre established in Harare and shortly thereafter moved to Nairobi
1995	T	*Ad hoc* approval to import a recombinant animal vaccine
	—	Jomo Kenyatta University and KARI conduct research on tissue culture bananas
1996	—	Tissue culture banana project with ISAAA begins
	S	Kenya Plant Health Inspectorate Service (KEPHIS) founded
1997	T	195 lines of sweet potato transformed
	S	UNEP-GEF first phase begins
	S	KARI forms its Institutional Biosafety Committee
1998	S	Guidelines for biosafety published, coordinated by NCST (UNEP-GEF project, also funded by USAID (ABSP)). Guidelines to harmonise with Convention on Biological Diversity.
	S	Formation of National Biosafety Committee (NBC)
	T	NBC approves sweet potato
1999	T	Insect-Resistant Maize for Africa (IRMA) launched (CIMMYT, KARI, Novartis)
	T	ISAAA joins the sweet potato project
	S	Biosafety framework established via UNEP-GEF project
	S	Environmental law (EMCA) passed and creates NEMA
2000	—	African Biotechnology Stakeholders Forum (ABSF) founded
	T	Actual transfer of sweet potato from Monsanto to KARI
	S	Kenya signs the Cartagena Protocol
2002	S	Kenya ratifies the Cartagena Protocol
	S	Seeds and Plant Varieties Act of 1972 was amended to accommodate biotech
	S	UNEP-GEF second phase begins—three-year project to implement national biosafety framework
	—	Kibaki elected president
2003	S	Cartagena Protocol enters into force (over 50 countries have ratified it)
	T	NBC approves Bt cotton for research and contained trials
	T	NBC approves genetically modified cassava for research and contained trials
	T	AATF is founded begins work on at least five PPPs to develop ag-biotech
	S	Draft biosafety bill prepared
2004	T	Report of sweet potato failure circulate around national and international media
	T	IRMA phase II green house is opened by President Kibaki
	S	Biosafety bill awaiting Cabinet approval
	—	Biosciences East and Central Africa, NEPAD centre of excellence, inaugurated in Nairobi
KEY		
T	=	Event related to development of modern biotechnology
S	=	Event related to development of biosafety system of Kenya
—	=	Event not specifically related to either technology or biosafety developments

Timeline created by author based on the following sources (UNEP-GEF, 2002; Odame *et al.*, 2003a; Traynor and Macharia, 2003; Velho *et al.*, 2004; M. Karembu, personal communication, April 2004; F. Majiwa, personal communication, November 2004).

The first large-scale biosafety project started in 1993 and was sponsored by the Netherlands Directorate-General for International Co-operation (DGIS). Kenya was one for four partner countries selected for this project. The DGIS project aimed to develop a biotechnology 'platform' for Kenya targeted at poverty alleviation. It involved elements of both developing specific technologies, as well as developing national regulatory and biosafety capacity. It set national priorities, stating that tissue culture and other low biotechnologies had great potential in Kenya, but that Kenya should start to focus on developing modern biotechnologies as well (Olembo *et al.*, 1996).

The DGIS programme laid the groundwork for the next major donor-sponsored project co-ordinated by United Nations Environment Programme–Global Environmental Facility (UNEP–GEF) in 1997. The Pilot Biosafety Enabling Activity Project of UNEP–GEF was aimed specifically at helping Kenya (and 11 other countries) develop biosafety frameworks. It also aimed to develop mechanisms for 'cross boundary movement of living modified organisms' (UNEP–GEF, 2003a).

Both the DGIS and UNEP–GEF programmes co-ordinated with the government of Kenya via the National Council of Science and Technology (NCST). The NCST was created within the Ministry of Education, Science and Technology by the Science and Technology Act (last amended in 1980). The NCST is charged with advising all government departments on issues of science and technology.

Largely because of the support of these two programmes, the NCST produced biosafety guidelines and a biosafety framework. The biosafety guidelines, published in 1998, set up the initial governing structure to address issues of risk assessment and safe handling of GM products. Primarily, these guidelines stipulated the formation of the National Biosafety Committee (NBC).[4] The NBC became the body charged with co-ordinating all biosafety efforts and regulation, including approval of all biosafety applications for biotechnologies to be developed in Kenya. The NBC falls under the purview of the NCST. The National Biosafety Framework for biotechnology regulation was developed in 1999, also mainly via the UNEP–GEF programme (UNEP–GEF, 2002). The framework established the structure for regulating biosafety, identifying the role of relevant ministries and government agencies.

The biosafety guidelines were first written before the Cartagena Protocol[5] on biosafety was signed and ratified by Kenya (in 2000 and 2002 respectively). Also, the guidelines only address contained research and trials of genetically modified organisms (GMOs), not commercial release. These are issues that the second phase of the UNEP-GEF project is addressing. This phase of the project (2002–05) is charged with helping countries implement the biosafety schemes developed in the first phase.

There have also been many less direct but significant donor contributions to the development of biosafety regulation in Kenya. For instance, the Agricultural Biotechnology Support Program, Part I (ABSP I) centred at Michigan State University and funded by USAID, trained scientists from Kenya via an internship programme. The focus was on teaching the scientists to help develop a regulatory scheme so that products could be tested

[4]Kenya also has two Institutional Biosafety Committees. These committees are located within the Kenyan Agricultural Research Institute and within the International Centre for Insect Physiology and Ecology. Biosafety applications must be approved by the relevant Institutional Biosafety Committee before moving on to the National Biosafety Committee.

[5]The Cartagena Protocol on biodiversity is a protocol that was drafted as a supplementary agreement to the Convention on Biological Diversity of UNEP. It came into force once in 2003 after 50 countries had ratified it.

and exchanged internationally (ABSP, 2002). In addition to the ABSP I scheme, Kenyan biosafety system is also currently obtaining support from the Programme for Biosafety Systems, co-ordinated by International Food Policy Research Institute and sponsored by USAID. The Programme for Biosafety Systems seeks to further supplement implementation of biosafety systems in those countries that received UNEP–GEF funding (PBS, 2005).

The support of these multiple donors and over a decade of work has shaped the current biosafety regulatory system. The current system is a slightly updated adaptation of that setup by the 1998 guidelines and the 1999 framework. It is an amalgamation of many government ministries, agencies and institutes based on various and complicated webs of existing legislation (see Figure 1). Despite the support of these multiple donors, Kenya still has not tabled a biosafety bill in parliament. At the time of writing, the draft bill is awaiting approval from the Cabinet. The significance of this situation and events surrounding the draft bill will be discussed in more detail below. First the concepts of formal and informal governance are introduced and used to critique the governance of biotechnology in Kenya, and focus on the possible loci of participation and accountability.

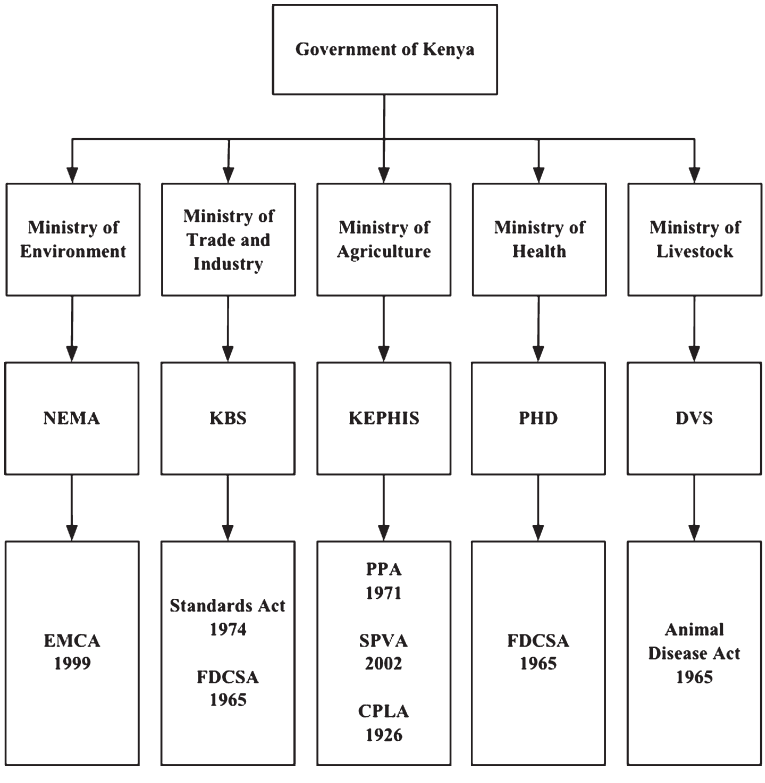

Figure 1. Kenyan multi-agency system for regulating biotechnology. Acronyms used in the figure: National Environment Management Authority, Environmental Management and Coordination Act, Kenya Bureau of Standards, Food, Drugs and Chemical Substances Act, Kenya Plant Health Inspectorate Service, Plant Protection Act, Seeds and Plant Varieties Act, Crop Production and Livestock Act, Public Health Department, Department of Veterinary Services

3 GOVERNANCE: FORMAL AND INFORMAL

Governance is generally used in this paper as a concept to address 'the process of decision-making and the process by which decisions are implemented' (Bhardwaj, 2003), specifically relating to decisions surrounding biotechnology in Kenya. Two aspects of governance are the focus of this paper—participation and accountability. Participation is used here to address who is taking part in decisions and accountability is used here to address responsibility and liability for decisions.[6]

Governance in general has become a somewhat contested concept, having different but related connotations in academic, development and state communities in the North and South. Several of these conceptions of governance contribute to the use of governance in this paper, and the distinction made here between formal and informal governance. It is important to clarify and briefly review these ideas.

A first significant conception of governance has emerged largely from international relations, policy studies, and political science in Northern developed countries. Here governance is a concept used to address the way that decision-making has been changing in these states since the 1980s onwards (Hajer and Wagenaar, 2003). The main argument is that given a confluence of factors—such as the emergence neo-liberal economic policies and economic globalization—states have shifted from a mode of *government* towards a mode of *governance* (see Rhodes, 1997; Jessop, 1998; Pierre and Peters, 2000). Whereas states previously governed in a more top-down, hierarchical style, states now function more as co-ordinators. It is a shift from 'command and control' to negotiation (Pierre and Peters, 2000), where states negotiate amongst a wider set of actors that play a role in policy decisions and implementation. These actors include the private sector and local and national non-governmental actors, as well as international policy bodies such as the European Union and the World Trade Organization.

These Northern conceptions of governance can be distinguished from the use of governance as a concept in Southern developing countries.[7] Here the World Bank and the International Monetary Fund refer to 'good governance' (see World Bank, 1997). Good governance is a kind of yardstick held up in opposition to corruption and anti-democratic practices in the governments of developing countries. Thus for these international lending organizations, good governance becomes a normative concept. It is a prerequisite for the flow of aid to a country. It is something that is tested for in recipient countries (see World Bank, 2005), relating to specific policies. As such, the push for good governance by donors restricts state actions.[8]

To some extent then, the Northern transition from government to governance and the Southern push for good governance converge in that both concepts leave a state that is forced to negotiate and co-ordinate between actors at different levels (Harsh and Smith, 2004). Whereas Northern states are losing direct political control, Southern states have mostly never had such direct control. Despite this very different history of power relations,

[6]Participation and accountability have a long and contested history in development, both as analytical concepts and as practical tools. See for instance Brett (2003) for a useful review. The general definitions of participation and accountability adopted here were used empirically when collecting data for the case study on the biosafety bill discussed below.

[7]As Murphy (2004) points out, both of these conceptions of governance can also be distinguished from the focus on corporate governance and reform that has been occurring since the Enron scandal in the United States.

[8]Thus from a left critique, good governance can be seen as a mechanism for international lending organisations to push a neo-liberal development agenda.

the emerging Northern focus on governance as negotiation and co-ordination of a wide set of actors is a useful framework in the Southern context.

Threads can also be drawn together from the North and South in terms of another related emerging conception of governance—the distinction between formal and informal governance. Informal governance in North is a concept that is mainly emerging out of analysis of policy making in the supranational bodies, like the European Union. Here informal governance refers to non-codified and non-institutional mechanisms that affect decision-making, such as personal relationships, webs of influence and unwritten routines (Christiansen and Piattoni, 2004). In the South, the term informal governance tends to refer to decision-making that occurs via local (often at the level of villages, tribes or castes) non-governmental mechanisms (Ananth Pur, 2004). The implication in both cases is that formal governance is codified, official and institutional while informal governance is the antithesis of these qualities.

For the purpose of this paper formal and informal governance are used as concepts to analyse decision-making surrounding biotechnology in Kenya. Formal governance is used here to describe state policies and laws, establishing regulatory procedures and structures constituting a framework for guiding the development and use of biotechnology. I include *policies* in addition to *laws* to incorporate aspects of negotiation in governance as discussed above in the experiences of Northern states. Policies can be seen as negotiations or co-ordinating acts that are done under the auspices of the state, although might not be formally established as legislation, such as memorandums of understanding between actors.

Informal governance, on the other hand is used to describe decision-making and implementation regarding biotechnology that happen outside the sphere of official state structure and influence. This includes aspects like those mentioned above in the context of the EU, such as personal actions and non-official declarations by state actors. Importantly, however, I also use the term informal governance to include decision-making and implementation that occur within non-governmental organisations. I thus expand on the concept of informal governance used in Southern contexts to include non-state actors operating at all levels, not just the community or village level.

4 INFORMAL AND FORMAL GOVERNANCE OF BIOTECHNOLOGY IN KENYA

Formal governance of biotechnology in Kenya is the institutional and regulatory system that is being established via donor assistance as described above and summarized in Figure 1. Some obvious criticisms of this decision-making framework are apparent. Firstly, the development of biotechnologies and the development of policies and laws to regulate them have been happening concurrently (see the timeline in Table 2). This is contrary to other East African countries such as Uganda where a position has been taken that no GM research or trials shall occur until a policy and regulatory legislation are prepared and approved (Harsh and Wafula, forthcoming). This situation has forced the development of regulations in Kenya to be largely *reactive*. For instance, the development of GM technologies initially began before the process to formulate policy and enact legislation. The first modern biotechnology project in Kenya, the VR sweet potato project, began in 1991, long before the formation of the biosafety guidelines and the National Biosafety Committee in 1998. Furthermore, the approval to import the transgenic sweet

potato came just a few months after the biosafety guidelines were issued, leaving critics to question how much the research agenda and research organisations were driving biosafety developments (Odame *et al.*, 2003a).

This reactionary approach in formal governance is far from ideal, not least because it does not allow for adequate strategic co-ordination or planning to steer the development of technology. There is evidence that co-ordination and steering is still weak within the Kenyan biosafety system. Strategic linkages between the NBC and the three international research centres in Nairobi that deal with agriculture (ICIPE, ILRI and ICRAF)[9] are generally weak (E. Osir, personal communication, November 2004). ILRI is the only institute formally represented on the NBC. Furthermore, the NBC, does not generally approach these institutes to request specific research, or learn about relevant ongoing research that could be strategic for national development (*ibid.*). This is disheartening because most other East African countries do not have the benefit of multiple international research institutes within their borders.

Adequate awareness of biosafety issues and the capacity to assess them are also weaknesses of current formal governance. It took over two years for the importation of the transgenic sweet potato due to lack of scientific capacity such as a shortage of molecular biologists and containment facilities (Traynor and Macharia, 2003). According to official representatives at the NCST, the situation is improving (H. Macharia, personal communication, January 2005). However, ministers and other government officials outside of the small biotechnology elite can still be largely ignorant about risks and benefits of biotechnology[10] (M. Karembu, personal communication, November 2004). Without scientific inputs and better training of decision-makers, formal governance will remain handicapped.

Most importantly, the current system of formal governance is operating under a 'legislative vacuum' (Wakhungu and Wafula, 2004, p. 43). The biosafety guidelines, biosafety framework and the NBC itself were all created by the NCST under the legal authority of the Science and Technology act of 1980. This act gives the NCST authority to advise the government on science and technology issues. However, it grants no regulatory authority to the NCST or NBC. Until a biosafety bill is passed in parliament, the NBC has no legal authority to enforce violations of the biosafety guidelines (Traynor and Macharia, 2003). Currently the only clear legal authority regularly exercised is that of the Kenya Health Plant Inspectorate Service. Moreover, this authority is only in terms of permits for importation and facility certification (Wakhungu and Wafula, 2004). Even if no serious violations of the biosafety guidelines occur, the lack of legal regulatory authority could cause unease among certain stakeholders and publics were it more widely known. Additionally, the lack of legislation also leaves a non-unified regulatory environment for biotechnology in Kenya. As it stands, the NBC does not have co-ordinating legal authority. The five ministries and multiple agencies involved in regulating biotechnology still hold precedence over their respective aspects of biosafety (anonymous Kenyan official, personal communication, November 2004). This could lead to possible conflict of interests between ministries or agencies with no legal mechanism for resolution.

[9]The International Centre for Insect Physiology and Ecology (ICIPE), the International Livestock Research Institute (ILRI) and the World Agro-forestry Centre (ICRAF) are all located in Nairobi.

[10]It is important to note here that several organisations like ISAAA and ABSF have committed much time and energy to educating decision-makers about biotechnology, including running several workshops for Members of Parliament. Turnover in Ministers after the new government was elected in 2002, however, has been an obstacle to raised awareness about biotechnology (M. Karembu, personal communication, November 2004).

Overall, although the current formal governance of biotechnology in Kenya has the ability to approve technologies, it largely does not include mechanisms to enforce regulation or include mechanisms for strategic decision-making to guide technology development. If regulations cannot legally be enforced, then there is no accountability for decisions. The private sector, international donors or international research institutes cannot be legally held accountable to publics and farmers for their actions, should their actions violate biosafety guidelines. The general lack of authority and strategic decision-making in formal governance makes examining informal mechanisms for the governance of biotechnology critical.

The reality in Kenya is that governance of biotechnology is largely informal. For instance, because of a lack of a clear formal policy towards biotechnology and lack of awareness about biotechnology, many prominent ministers and officials often make ad-hoc media statements regarding biotechnology (Odame *et al.*, 2003b). These statements are mostly in support of biotechnology, focusing on potential benefits over potential risks. Statements range from the more confusing and obscure to more formal speeches given at exclusive events. Almost always the national media will publish the statements in stories with strong headlines. For instance, in a story published with the headline 'Famine: State accepts GM food', Dr. Wilfred Machage, the Assistant Minister for Special Programmes in the Office of the President, recently suggested that Kenya will accept GM food aid (Waweru and Laboso, 2004). This statement, however, was in direct conflict with an official press release sent to all newspapers by the Ministry of Agriculture, which stated that all maize imports must be inspected and certified as GM free (E. Kisiangani, personal communication, October 2004). Non-official and *ad hoc* statements by government officials can confuse and convolute publics. They create false awareness about official state policies and about who is responsible for them.

Even more prominently, the president of Kenya, Mwai Kibaki, recently advocated biotechnology in a speech at the opening of a biosafety greenhouse:

> We must embrace and apply modern science and technology in farming. Indeed, there is evidence that countries that have embraced modern agricultural technologies have improved economic performance, reduced poverty, and ensured greater food security for their people (*Daily Nation*, 2004).

This informal advocacy for biotechnology is not unique to the current administration. The former president of Kenya, Daniel Arap Moi, wrote a letter to then President Clinton of the USA in August, 2000 requesting the USA to help Kenya develop biotechnology (Moi, 2000). In the absence of an official legal platform to develop biotechnology, it seems premature to make such informal declarations and requests.

Even more important than creating confusion about the status of decisions amongst publics, is the role informal governance plays in the process which decisions are actually made. As mentioned above, all the biotechnologies currently being developed in Kenya are carried out via public–private partnerships (Table 1). All of these partnerships have originated from outwith Kenya. They have been aimed at local problems but their original impetus was from multinational companies, international donors or international research organizations (Wakhungu and Wafula, 2004). This would be less problematic if formal governance was strong with better mechanisms to accept, reject, modify and enforce these projects according to national priorities. However, interaction between the public–private partnerships that are developing technologies and formal governance is mostly limited to permit applications to import plant matter or build scientific facilities. The state is not an

active partner in co-ordinating decisions about what technologies to develop and how to develop them. These decisions are largely left to non-governmental actors, namely the donor organisations, international research institutes and NGOs co-ordinating partnerships. As the shape of and interaction between informal and formal governance stands now in Kenya, participation of publics and farmers in decision-making and accountability to them can largely only occur if it is facilitated via the informal governance of public–private partnerships.

The current biosafety bill presents an opportunity for Kenya to change this topography of governance. The biosafety bill represents a chance to encourage co-ordination and crosstalk amongst government ministries and departments (anonymous Kenyan official, personal communication, November 2004). This could provide formal governance with the ability to more strategically guide biotechnologies and make them more relevant to local needs. It could also provide formalized mechanisms for participation.[11] Through the biosafety bill, regulatory systems will acquire legal authority and actors could thus be held accountable. In general, the bill could give technology developments a national mandate in the face of criticism that current biotechnology developments are driven by the concerns of international partners.

5 THE DRAFT BIOSAFETY BILL

How is the government of Kenya taking advantage of the biosafety bill as a fulcrum for increased accountability and participation? In general, recent developments surrounding the current draft form of the biosafety bill have been controversial. In terms of accountability, there has been a general lack of transparency on the part of the Kenyan government, specifically the National Council of Science and Technology. Several civil society groups engaged in advocacy for small-scale farmers and the environment were refused copies of the draft bill upon making a request to the NCST (T. Anderson, personal communication, November 2004). The author and other representatives from his research institute, the African Centre for Technology Studies, were also refused copies of the draft bill. The NCST argues that it does not have the capacity to filter information and decide what to release to the public and what to keep confidential (H. Macharia, personal communication, January 2005). Regardless, given that the National Biosafety Committee also does not make their minutes available to the public (Traynor and Macharia, 2003), the denial of requests to acquire the draft bill closes off another avenue for accountability. One NGO respondent summed up the situation stating, 'The biosafety process has been very secretive. They think it is the domain of scientists and a few in government' (T. Anderson, personal communication, November 2004).

Accountability and participation are clearly interrelated in the current biosafety process. In terms of participation, there is strong evidence that there is continuing under-representation of some interests in the policy process. On 20 August 2004, a coalition of civil society organizations[12] issued a declaration about biotechnology in Thika, North of Nairobi. In the declaration, small-scale farmers represented by the Kenya Small Scale

[11]Increasing public awareness is a stated focus of the current revisions of the draft biosafety bill (NCST, 2004) and is stipulated by Article 23 of the Cartagena Protocol.

[12]The organizations include the Intermediate Technology Development Group, Participatory Ecological Land Use Management, Action Aid and the Kenya Small Scale Farmers Forum.

Farmers Forum (KESSFF) raised concerns about the development of GM crops in Kenya. Introducing GM crops, they argued, could cause environmental risks and threaten traditional farming methods that are key to their livelihoods, such as saving seeds from harvest to harvest. The declaration called for more participation of small-scale farmers in the policy process regarding biotechnology in Kenya (KESSFF, 2004).

In general, organizations representing small-scale farmers and environmental advocacy have largely been absent in the biosafety process thus far in Kenya (E. Kisiangani, personal communication, November 2004). This not to say that stakeholders have not had chances to voice their interests in the biosafety process. All of the large-scale donor funded initiatives discussed in the first section above have included stakeholder workshops (see, for example, UNEP–GEF, 2003b). In addition, groups such as the African Biotechnology Stakeholders Forum, ISAAA and BTA have conducted other workshops. Indeed, participants in these workshops have generally come to have representation on the National Biosafety Committee (see Table 3). However, a core group of civil society groups representing small-scale farmers and environmental advocacy have not been present at workshops and are not represented in the NBC or the biosafety process in general. The excluded civil society groups argue that the situation leaves issues of food security and environmental sustainability, particularly how they relate to small scale farmers, absent from the biosafety agenda (Z. Makanya, personal communication, November 2004).

Why these groups have not been represented at meetings and in the NBC is not clear. It is clear that none of the groups have ever been invited to any of the stakeholders meetings or to NBC meetings (A. Wauye, personal communication, November 2004). They claim that it is only through personal, 'back-door' inroads that they have had any chance

Table 3. Composition of the National Biosafety Committee in Kenya

Secretariat	
National council for science and technology	
Ministries	
Ministry of agriculture and rural development	Ministry of trade and industry
Ministry of education science and technology	Ministry of health
Regulatory agencies	
Kenya bureau of standards	Kenya plant health inspection service
National environment management authority	Kenya industrial property office
Research institutes	
International livestock research institute	Kenya medical research institute
Kenya agricultural research institute	
Government departments	
Department of research development	Kenya wildlife service
Universities	
University of Nairobi	Kenyatta university
Non-governmental organizations	
Consumers information network	Seed trade association of Kenya
African biotechnology stakeholders forum	Biotechnology trust Africa
Kenya national farmers union	

Adapted from Traynor and Macharia (2003).

to participate in the biosafety process at all. 'It can be a total fluke if NGOs are involved' (T. Anderson, personal communication, November 2004). It is generally the responsibility of the organization co-ordinating a stakeholders meeting to invite stakeholders and make the meeting known to wider publics (M. Karembu, personal communication, December 2004). Some of the civil society groups that have not attended meetings have had a relatively low public profile until recently, such as KESSFF. It might be understandable that these groups would not find out about workshops. However, some groups such as ActionAid have been working with small-scale farmers on food security issues since the 1970s. Certainly these groups should have heard about workshops.

Several organizational considerations regarding the civil society sector and the way it interacts with the government are contributing to this lack of participation. Firstly, the network of NGOs in Kenya is fragmented. For example, the Kenyan National Farmers Union (KNFU) has been participating in the biosafety process and is represented in the NBC. KESSFF recently formed as a sliver group from KNFU because they felt that KNFU was only representing larger-scale farmers (M. Shaha, personal communication, November 2004). The NCST argues that it is too overloaded to deal with multiple farmers groups, or assess which one is more representative (H. Macharia, personal communication, December 2005). It views all the NGOs that it has on board as channels of participation. Unfortunately, the proliferated and fragmented reality of civil society in Kenya can close off these channels.

Connected to fragmentation, there is a general air of conspiracy and secrecy amongst some NGOs that have not been involved in the biosafety process. For some, the debate has become ideological and polarized. There is a sincere 'us versus them' and 'anti versus pro GMO' mentality. The NGOs argue that spies have infiltrated previous coalitions (A. Wauye, personal communication, November 2004) and now trust has become a barrier to coalition building and communication between NGOs, and between NGOs and the government (*ibid.*). Finally, many of the NGOs not participating state that a lack of resources (both staff time and funding) is a barricade to getting more involved in biotechnology and biosafety issues.

Regardless of why these civil society groups have not been involved, the biosafety process in Kenya is surely losing out on a wealth of relevant expertise by not having them on board. Participants that have been part of the biosafety process seem to agree. The Director of the Consumer Information Network, a group that has been part of the biosafety process almost from its inception, stated that 'We have missed their voices inside the house'—regarding the lack of food security and environmental advocacy civil society groups involved in the biosafety process (S. Ochieng, personal communication, November 2004).

The most recent controversy surrounding biotechnology in Kenya is also not promising for the biosafety bill. On 7 December 2004 MP Davies Nakitare tabled a bill calling for a ban of all GM crops in Kenya, stating that the government has no policies to deal with such crops (East African Standard, 2004b). Shortly after this bill was tabled, farmers from across the country held a press conference to express their opposition to the draft biosafety bill and their support for the bill to ban all GM crops. Their specific call for more small-scale farmer representation in the biosafety process has received attention in print and radio media (East African Standard, 2004a; Capital FM, 2005). The debate surrounding biotechnology clearly continues to remain polarized. This current atmosphere of polarization into which the biosafety bill must enter will make it much harder for publics to endorse the biosafety bill.

6 CONCLUSION

Current controversy surrounding the biosafety bill has exaggerated fragmentation in the biosafety process. The opaque behaviour of the NCST has not added to accountability. In terms of participation, the absence of civil society groups that represent small-scale farmers and environmental advocacy is certainly a loss of resources and can be further construed as an act of exclusivity. Given this controversy, it is unlikely that the current draft biosafety bill will create a national mandate for biotechnology developments.

Furthermore, it is unlikely that such a mandate will ever come solely from reforms of formal governance. This point is clear when the draft biosafety bill case is seen in light of the general analysis of formal and informal governance of biotechnology presented above. From this perspective, the case of biosafety is the most recent example of mainly unsuccessful efforts to make formal governance of biotechnology more participatory and transparent. Given this now decade-long entrenchment of institutional reactivity and fragmentation, it is possible that Kenya might not ever fully develop a strong formal governance mechanism for biotechnology.

Informal governance will likely remain the main mechanism for strategic decision-making regarding biosafety and biotechnology more generally. This is not deleterious *per se*. Informal mechanisms will always be part of technological decision-making. Especially in Kenya, however, efforts must be made to make informal governance mechanisms more inclusive of a broader range of social interests and represent a larger portion of civil society space. Moreover, efforts must also be made toward more productive interactions between informal and formal governance. Both of these tasks represent significant challenges upon which some light can be shed by returning to the specific case of biosafety.

If the biosafety bill is tabled and passed, formal governance will gain legal regulatory authority and should have more ability to steer technological developments. This, however, will not automatically do anything to more actively increase the participation of civil society in representing small-scale farmers and decrease polarization. If the biosafety bill is passed without any further efforts of participation, a poor precedent will be set for future involvement of publics. Formal governance will be perceived as now having the ability to steer technology, but not necessarily in the direction that most benefits small-scale farmers.

A few policy actions could help this situation be avoided. The key point here is that communication needs to be increased between civil society organizations and the government, generating more debate amongst publics. Firstly, the Kenyan government should make a purposeful and far-reaching effort to involve publics and farmers before the biosafety bill is sent to parliament. There was some indication that this might happen (Anonymous Kenyan official, personal communication, November 2004), but the official stance of NCST is that the government will only follow normal procedures (H. Macharia, personal communication, December 2004). This only involves a low profile comment period before the bill is sent to lawmakers. Secondly, despite the support of the UNEP–GEF programme, the NCST and NBC continue to struggle with capacity issues. There are currently efforts via the Biosafety Clearing House programme[13] to help the NCST better disseminate information to the public (*ibid.*). More assistance, however, is needed from

[13]The Biosafety Clearing House programme is an 'information exchange mechanism established by the Cartagena Protocol on Biosafety' (UNEP, 2004).

donors so that the NBC has capacity to more effectively interface with civil society. Thirdly, donors that currently fund those civil society groups that are not participating in biosafety should increase funding to those groups in order to increase their capacity to engage in debates. This increase in support, however, should only come on the condition that the groups enhance communication with each other and with the NCST. Donors should encourage official and public declaration of civil society coalitions. This would raise awareness and spark debate within wider publics and raise the general profile of these coalitions, hopefully leading to their increased participation in biosafety developments.

The policy implications of this situation could indeed have long-term future ramifications. During the development of regulations for GM crops in Europe, lack of initial participation of environmental stakeholders and an overzealous push by firms for less restrictive regulations led to a powerful backlash against the technologies. Public and consumer groups shifted from a neutral stance towards GM crops to a stance of strong value-opposition to GM crops in the 1990s (Tait *et al.*, 2004). Once a strong value-based oppositional stance is taken, it is unlikely that opinions will easily change (ibid.). The European situation could easily repeat itself in Kenya. Short-term efforts at increased participation now could bring long-term benefits to all sides of the debate.

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