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GMO Governance in Africa[i]

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GMO Governance in Africa

Abstract

The importance of governance arrangements for governing GMOs is widely acknowledged, but insufficiently practised. The paper examines legitimation and harmonisation issues around evolving GMO governance in Africa. It draws on empirical research from Ethiopia, South Africa and pan-African biosafety system harmonisation initiatives. Analysis shows that the process of institutionalising biosafety systems has become a major source of contention, and dominant protagonists have emerged on either sides of the debate. The legitimacy of the emerging systems is however at stake, as those making and implementing the rules are perceived as having failed to find a way through the competing views and concerns over GMOs. The paper concludes by highlighting the need for a competence-based and more inclusive approach to governing GMOs.

Introduction

A number of factors have gradually brought the genetically modified organisms debate into the public domain in Africa. These include research and development, the prospect of widespread commercialisation of genetically modified (GM) crops, and trade and food aid in GM products. There is now a widely perceived need to harmonise biosafety systems across the continent. The controversy in 2002 over USA GM maize food aid to some African countries was notable (Zondi, 2003; Newell, 2003). Moreover, as signatories of the Cartagena Protocol on Biosafety, many African countries are currently engaged in the implementation of the Protocol's biosafety framework. This paper discusses the emerging regulatory systems in Ethiopia, South Africa and at pan-African level.

While institutionalising biosafety systems is ongoing, across the region opinions about genetically modified organisms (GMOs) remain as polarized as ever. Proponents see GMOs as potential sources of increased food supply and environmental sustainability resulting from, for example, reduced application of chemicals (Wambugu, 2003). Opponents not only contest such claims but also emphasise the potential risks - that GMO might deplete biodiversity and increase the vulnerability of smallholder farmers (Egziabher, 2003). Hence many actors, including GMO developers and suppliers, government and non-governmental agencies, demand involvement in GMO decision-making and implementation processes (Feidberg and Horowitz, 2004; Harsh, 2005). However, while the literature widely reports on the disagreements over the inherent attributes of GM technology, it overlooks the process by which GMO rules and institutions are constituted and legitimised in Africa. This paper fills this gap.

The paper examines the extent to which GMO governing bodies accommodate contested views and produce integrated solutions in Africa. Ethiopia and South Africa offer contrasting examples, evolving under different historical and socio-economic conditions. South Africa has been approving GMOs since 1990, and passed a GMO act in 1997. But its decisions have been contested, and sometimes criticised for being controlled by technology developers and suppliers, and for giving little attention to socio-economic concerns. Ethiopia, with no research and development (R&D) or GMO field trial programme, started implementing the Cartagena Protocol on Biosafety (the Protocol hereafter) in 2004. The focus of the emerging system has been to address the potential adverse effects of GMOs on smallholder farmers and the country's biodiversity. Some actors see the emerging system as prohibitive to the

development and use of the technology as its standards exceed that provided for by the Protocol, for example, by endorsing 'socio-economic conditions' as evaluation criteria. What explains the contrasting features of the two national regulatory systems, and what does it mean for Africa-wide biosafety system harmonisation?

Analysis of empirical evidence reported here shows that, besides the disagreements on the inherent attributes of the technology, the process of rule making and institutionalising GMO administration has become a major source of disagreement as it tends to be dominated by one of the main protagonists, leaving little confidence in the minds of those marginalised that the governance system would be free of bias. At pan-African level, biosafety systems harmonisation is pursued to minimise differences on the outcome of decisions on GMOs. At the national level, it aims to legitimise a particular model of international/continental legal or voluntary instrument. However harmonisation initiatives sometimes lack a mandate and are not 'owned' by African institutions. Differences in the methods of harmonisation are also making convergence all the more difficult.

The evidence used in this paper was drawn primarily from 26 detailed interviews with key actors involved in the development of GMOs in Ethiopia, South Africa, and at pan-African level in 2005. It also draws from legal and technical documents related to GMO governance.

The rest of the paper is structured into five sections. The next section discusses the concept and theory related to legitimacy of governance of new technologies, particularly GMOs. Sections three and four discuss evolving GMO governance in Ethiopia and South Africa, respectively. Section five relates findings, and discusses pan-Africa biosafety harmonisation initiatives. Section six concludes the paper.

The Role and Legitimation of GMO Governance

Research has increasingly looked at actors' participation in the politics and decision-making process of GMOs (Purdue, 1999; Harrison and Mort, 1998; Black, 1998; Haas, 2004; Feidberg and Horowitz, 2004). It has focused on the modalities of participation, such as citizens' juries, deliberative polls and public consultations. Actors' standing in relation to the technology, and communication between actors, is considered. These participation strategies are meant to bring in new perspectives to better understand the problem at hand, enlist support for implementation of policy and increase trust in governance (Haas, 2004). Black articulates that opening up the decision-making process means to 'deny any one voice authority in that process, and

through the integration of views and perspectives to arrive at accepted solutions to intractable problems' (Black, 1998: 622).

Purdue (1999: 80) summarises models that governments use to legitimise their decisions on science and technology as: expert model, democratic model and pragmatic model. The expert model often consists of a committee of 'recognised experts' who claim to be 'independent of commercial and sectoral interests'. The democratic model allows, or claims legitimacy for, public debate of different or sometimes conflicting preferences. Finally the pragmatic model is based on a committee of actors involved in the issue, and membership is wider than an 'expert group'. Each model is subject to criticism, for example, none directly involves citizens' decisions on science and technology policy.

To clarify some terms, actors here means those parties concerned and affected by the GMO rules and rule making processes. They are government research organisations, universities and the private sector, involved in the development and commercialisation of biotechnology. Actors include agents from relevant government departments (such as agriculture, health and the environment), farmer and consumer organisations and civil societies. As Matz and Ferenz note, actors want to see solutions to contested issues. They often tend to be 'organised to speak with something approaching a unified voice' and distinguished on the basis of the values and interests they represent (Matz and Ferenz, 2005: p. 42). They have the 'power to thwart a solution or decision' (Carlson, 1999, quoted in Matz and Ferenz, 2005: p. 42).

Actor participation is conceptualised as being able or free to be involved in (or consulted about) GMOs; influence its outcomes; and be responsible for the consequences. Besides the well recognised benefits of participation (Haas, ibid), participation has an inherent social value – the opportunity to participate creates a perception or belief about the system being fair.

The literature assigns different meanings to governance, including allowing non-governmental organisations and the private sector, participation in decision-making processes over complex matters such as GMOs (see review in Lyall and Tait, 2005). It is often argued that conventional government agencies, acting on their own, are insufficiently accountable to public demands, and lack the knowledge and resources to address complex issues such as GMOs. The governance arrangement is widely understood to fill these gaps by drawing on multiple actors' knowledge and resources and enhancing accountability. Following Hurd legitimacy is conceptualised as an

actor's acceptance of authority which may emerge from the 'substance of the rule or from the procedures or source by which it was constituted' (Hurd, 1999: 381). Hurd (ibid) underlines that the presence of legitimate institutions as an 'authority' produces stability and predictability.

Some key points regarding GMOs regulation need further elaboration. First, regulation has a complex agenda. It provides for the necessary resources for overseeing GMOs across the relevant sectors and disciplines, as the development and application of the technology traverses industry and biological boundaries, involving such spheres as agriculture, food and health. Regulation faces the challenges of reconciling domestic laws as well as adopting relevant regional and international conventions. And, with the increasing drive for commercialisation and privatisation, it is the duty of regulation to ensure that public and private interests are balanced - for example, in overseeing how sovereign genetic resources are accessed and used.

Second, actors' participation involves not only deciding on and implementing activities but also making and institutionalising the rules of decision-making. This is particularly important as people's acceptance of authority largely depends on their feeling that it is legitimate and should be accepted (Hurd, 1999).

Finally, even when broader participation happens, it is not often a guarantee that deliberations or contributions are taken on board. Harrison and Mort report that in the 1990s, health and social service managers and professionals in the UK ignored the outcomes of public consultation and user involvement in such areas as mental health and physical disabilities. Consultation and involvement, they argued, were used as 'social technologies', a means of legitimising decisions and activities (Harrison and Mort, 1998: 67). An extensive review of experiences (for example, Matz and Ferenz, 2005) showed that multistakeholder negotiations are often enhanced if the process ensures that (i) relevant parties are involved in the negotiations, (ii) accurate scientific and technical information is made available, (iii) links with official decision-making bodies are made as consultation outcomes are not legally binding unless taken up by the official decision-making bodies, and (iv) fairness and efficiency are criteria for evaluation of negotiation process.

The term biosafety systems harmonisation has no standard definition but, based on interviewees' broader understanding, is used to mean the co-ordination of national biosafety policies, standards and guidelines, aimed at minimising or eliminating differences on the outcome of decisions on GMOs across cooperating states. The

benefits from harmonisation are often stated in terms of reduction in regulatory costs and increased trade in GM products. In generic terms, the mechanisms for harmonisation include an evolutionary process where independent systems acquire similarity over time; cooperative harmonisation by means of international legal instruments; or imposition by a stronger economic power (see, for example, Drezner, 2005; Busch and Jorgens, 2005).

Central to biosafety harmonisation, also, are approaches to the regulation of GMOs, North America and the European Union (see for example, Paarlberg, 2000; and Nap, et al., 2003). The two approaches have different foci: the North American approach is based on the characteristics of the product while the EU is concerned with the process by which the product is produced. North America relies on existing laws to determine liability for environmental damage, and harm to people and property. But the EU approach regards GMOs as 'something new and special' for which existing legislation is not sufficient, thus this approach presupposes new legislation. Many African countries are squeezed between these two approaches that often produce contradictory messages. The adoption of either approach at the national and/or continent level has considerable implications for biosafety systems building in Africa, including for the setting up of institutions and allocation of resources for implementing regulation, and trade in GM products.

Evolving GMOs Governance in Ethiopia

Background to the GMOs debate and regulation

The debate over modern biotechnology in Ethiopia largely focuses on agriculture and biodiversity, because of its significant role in the economy and society. Agriculture contributes 85, 46 and 92 per cent of total employment, gross domestic product and expert earnings respectively (Beintema and Solomon, 2003). Predominantly a smallholder farming system dependent on family labour for land preparation and planting, weeding and harvesting, Ethiopia's geographical position, range of altitude, rainfall pattern and soil variability also gives it a wide ecological diversity and a wealth of biological resources. Ethiopia's germplasm collection bank, according to interviewees, holds no less than 67 000 accessions of food crops and medicinal plants. Crop plants such as coffee and teff are known to have originated from Ethiopia, and germplasms of such native plants are likely to offer Ethiopia significant economic benefit from their global exploitation, for example, teff for gluten-free diets (Clark, 2005).

However, despite the wide variety of its genetic resources and diverse agro-ecological zones, Ethiopia is prone to periodic food shortages, attributed to recurrent droughts, environmental degradation, and pest and plant diseases. Success at increasing food supply is offset by increases in human population. Productivity enhancing measures focus on a narrow range of choices - extension programmes, seed improvement measures through conventional methods, and fertilizer applications (Degfe et al, 2002). Decades of agricultural research have produced a small range of technologies, largely biological varieties and breeds, and agronomical practices. The generation of chemical and mechanical technologies such as fertilizers and farm tools has been minimal (Mekonnen, 1995). Consequently Ethiopia to this day depends on an archaic plough culture. Many actors, notably members of the scientific community, argue for exploring every possible avenue for increasing food production and sustainable agriculture.

Ethiopia is a latecomer to modern biotechnology. Government policy in the early nineties (TGE, 1993) acknowledged the role of biotechnology and promised support. Progress, however, has been limited to pockets of research infrastructure and institution building activities, such as in the Ethiopian Institute of Agricultural Research, the Institute of Biodiversity Conservation and Addis Ababa University[i]. Biotechnology development in Ethiopia also faces several constraints including limited R&D capacity owing to a low science base; limited training, difficulties with recruitment and retention of graduates; and limited government and donor funding. Some donors seem to be reluctant to support R&D before the biosafety framework is put in place.

Institutionalising the Ethiopian Biosafety System: Process and Conflict

In January 2004 Ethiopia adopted the Cartagena Protocol on Biosafety, and subsequently, in collaboration with UNEP-GEF, embarked on implementing the Protocol's biosafety framework. The Ethiopian Environmental Protection Authority (EPA) championed the implementation process as it had relatively better knowledge, expertise[ii] and infrastructure for overseeing the implementation of regulation. To give more legitimacy and direction to the emerging institution, implementation started with the establishment of a National Steering Committee (SC), consisting of some 33 representatives from almost as many public and private organisations and civil societies[iii]. The composition of the SC suggested efforts made to exploit expertise and know-how located in different sectors.

However major differences emerged before long, between actors within and outside the SC, over the process of developing the draft bill, its content, and the proposed location of GMO administration. Almost all the scientists interviewed made it clear that their role in the process was at best marginal as (a) legal and technical documents were prepared by EPA lawyers and consultants under its guidance, (b) EPA was made, by default, the competent authority for GMO administration, and (c) by going beyond the requirements of the Protocol, EPA proposed the adoption of the 'protective' principles and criteria of the African Model Law on Safety in Biotechnology which, according to the interviewees, potentially limit the development of useful modern biotechnologies in the country. Some scientists alleged that their written submissions on the draft bill made hardly any impact. Some noted that, apart from a handful of seminars and discussions, the political space for (and culture of) participation itself was limited. Some also doubted EPA's neutrality in the process and felt that it controlled the biosafety implementation process in advancing its own environmental and biodiversity issues. So a number of scientists and science and technology policy-makers feared that if approved, the bill (and EPA as a competent authority) would limit the development of useful modern biotechnologies in the country.

EPA's leadership however justified their actions on the ground that neither most members of the SC nor other stakeholders have the required biosafety capacity to do the job. EPA also regards the Protocol as rather 'limited' on GMOs effects on 'human health and socio-economic considerations', and noted that there are no adequate domestic laws to address such potential risks. EPA's central argument is social and economic, focussing on concerns for smallholder farmers and losses of biological resources to multinational companies:

> [Some] patent owners are saying 'we will give it free'. But I don't believe that. If patents were to be given free to developing countries, why should they have existed in the first place? TRIPs of the World Trade Organisation... will make it compulsory for developing countries to respect patent owners... And when that happens a smallholder farmer, who requires negotiating for the use of patents around the world, couldn't even say 'I will continue as my parents did, I don't want your patented varieties'. [Patents] would put [the developing countries] in a totally new form of colonialism where the only resources we have, our biological resources, will also be controlled by companies in the north (Egziabher, head of EPA)[iv].

Some of the scientists hold similarly robust views, and share some of the concerns of EPA officials. The difference, however, was that many of the scientists see some scope for developing and exploiting GMOs:

> Current developments on GMOs focus on pest control and weed control. For the poor farmer with very little land holding but a lot of time to work on [their] farm, or in a situation where hand-weeding is possible, the GMOs out there are not very useful to them. However, GM crops can be useful where the land holding system is larger and where commercial spraying is now destroying biodiversity (an Addis Ababa University Professor).

Some interviewees suggested that any one organisation with 'particular interest' – one way or the other - should not lead on the implementation of the biosafety framework nor become a competent authority. The overwhelming view, however, was that whoever champions the process should be competent, work with other actors, and seeks to produce a national consensus over the matter.

Behind this polarised debate, the study found much common ground bridging the differences between the main protagonists of GMOs. For example, most interviewees agreed that commercially available GMOs have little relevance to Ethiopia as they are not on indigenous and drought resistant staple food crops. Many also agreed that the smallholder farmer issues are complex as, for example, segregating GM and non-GM crops on small (often multi-cropped) farms is technically and culturally difficult. They also agree that GMO development is expensive and skill intensive, and that if pursued could be at the expense of conventional R&D. They were also concerned that the introduction of GMOs could lead to the patenting of some biological resources of the country. But even stout sceptics see some benefits from the development and ownership of GMOs in Ethiopia. However, they argue that to counteract the privatisation of sovereign resources such as germplasm and address the more important issue of equity, GMO development should be undertaken within the public sector. However, the biosafety rule-making and institutionalisation processes were perceived to have failed to find a way through the competing views and concerns over GMOs, leaving sufficiently potent ground for contesting impending decisions on GMO activities.

GMO Governance in South Africa

South Africa is the economic and science and technology giant of Africa. It has been progressively supporting science and technology (S&T) via attracting foreign direct investment, as well as government investment. Priding itself on its S&T base, South Africa is poised to give leadership in knowledge economy, notably in the field of biotechnology in Africa (GSA, 2001).

Experimentation in and recognition of the potential uses of modern biotechnology in South Africa go back to the 1970s but there were no statutory rules and standards to regulate activities until 1990. Interviewees noted that South African scientists took the initiative and organised themselves under the South African Committee on Genetic Experimentation (SAGEN) in 1978 to advise government on matters of GMO regulation. The private sector, along with SAGEN, initiated South Africa's biosafety bill development, and in 1994 the government set up a committee that drafted the GMO Act. Approved by the parliament in 1997, the Act (GSA, 1997) provided policy and regulations for GMO activities. It created, within the Department of Agriculture (DoA), the Office of the Registrar for GMOs. It set up executive and advisory committees. Finally, it established an inspection service. According to the interviewees, the choice of DoA as the entry point for GMO administration (or competent authority) was influenced by some historical developments. First, as the Act was being written, most of the GM products were agricultural (such as crop plants). Second, DoA (unlike other departments) had a fair number of experts in biotechnology. It also has inspectorates and an inspection infrastructure that stretches down to province level.

While the Act was implemented in 1999, South Africa has been approving GM R&D, field trials and commercialisation since 1990. Approval over 1990-99 followed biosafety guidelines developed by SAGEN - commonly known as 'the green bible', and in accordance with existing legislation, notably the Agricultural Pests Act (Act No. 15 of 1983). To date South Africa is the only country on the continent to have commercialised insect-resistant maize and cotton, and herbicide-tolerant cotton, maize and soya-beans.

Some interviewees noted a number of flaws that led to contestation in the development of GMO regulatory institutions and the GMOs Act. Some saw the system as elitist and non-participatory. They noted that six of the eight members of the Executive Committee members were drawn from government departments developing or supplying the technology (the other two members being scientists

appointed by the minister of agriculture). Others noted that the system's decision-making criteria rest largely on scientific and technical inputs. The Act gives little consideration to socio-economic and biodiversity issues. Despite passing regulations in 2004, in the view of some interviewees GMO labelling is inadequate, and liability and redress issues are hardly looked at. Some referred to insufficient access to information and lack of transparency of decisions on GMOs. In particular Biowatch (a South African NGO that takes a sceptical view of GMOs) has been exerting pressure to gain access to information on GMO activities in South Africa, leading to a major court case against the governance body (it won a landmark case against the South African GMOs governing body in February 2005 - the right to access to information)[v]. Others commented that communication of the science was 'not good', particularly in the early days. Efforts to address this problem came later, after questions were raised and protests mounted. The establishment of agencies like AfricaBio - a pro-GMOs stakeholders association - and Biowatch have contributed to the debate over GMOs, awareness building, and innovative changes in the system. Finally, the common procedure for capturing non-technical public input into the GMO decisions making process is that applicants put notices in local papers inviting comment/consent from the public on their proposed activities. But, according to the some interviewees, few people read the papers and participate in the process.

The process of institutionalising GMOs in South Africa clearly drew its legitimacy from scientific expertise, independent review and decision-making processes – however that may be criticised by the opposition. Pro-GMO actors argued that centering the regulatory body on the DoA has enabled the system to draw on the expertise and knowledge of innovation practices, and technology assessment. The system copes well in processing applications and interpreting 'precaution'. Without compromising on safety, they argue, the system has reduced the costs of monitoring and administering GMOs.

The government has, in some areas, responded to the criticisms leveled against the GMOs governance system. For example, it has created a Public Understanding of Biotechnology unit to raise awareness levels in the country[vi]. Such government responses to some criticisms are shaping and reshaping the GMOs governance structure, the process however is ongoing. On 12 November 2003 South Africa accessed the Protocol. At the time of writing it was engaged in developing the second (revised) bill – which, it is hoped, will build on lessons learnt from its predecessor.

Harmonising Biosafety Systems in Africa and Discussion

Promoted by GMO activities, trade and food aid in GM products, a series of declarations and initiatives have been made towards harmonization of biosafety systems in Africa. Examples of initiatives include:

- The Organisation of African Unity (OAU) (now the African Union (AU)) produced model biosafety legislation for the continent in 2001.
- In 2005 the AU-NEPAD set up a high level African Panel on Biotechnology (APB) to develop an African strategy on biotechnology and biosafety.
- UNEP-GEF has been implementing the biosafety framework of the CPB for the last four years.
- USA and other developed countries have been providing resources to develop some pan-African biosafety systemsvii.

A closer look at these and other harmonization drives show a number of interesting points. Across the region, as interviewees noted, the convergence of biosafety systems is perceived as desirable, as it is hoped to overcome or minimize differences in the technical contents of rules and decision-making criteria so that differences on the outcome of decisions on GMOs between nations are minimized or eliminated. Expected benefits are often stated as expanding the pool of biotechnology and biosafety expertise available for the region, reducing regulatory costs, and enhancing trade in GM products.

Harmonisation initiatives are pursued at different levels by multiple actors: at the levels of sub-regional economic blocks (such as the Southern African Development Community), agricultural research organisations (such as the Association for Strengthening Agricultural Research in Eastern and Central Africa), and pan-African science and technology policy-makers such as NEPAD. Donors and multilateral organisations provide financial and technical support to these initiatives. However some initiatives lack a mandate and actor participation - in addition to practical logistical and financial constraints - participation is often influenced by donors and professional interest groups. Often processes are led by ad hoc working groups of scientists, and ‘representatives’ of non-scientific actors but some of the actors, notably farmers and consumers, often miss out. There is also replication of efforts, and often mismatches between the legal responsibilities of those attempting to produce harmonisation and those supposed to implement it.

Methods of achieving harmonisation are unclear, as there is no single model to converge to. Analysis of the empirical evidence brought out three key emerging typologies of biosafety harmonisation: *cooperative, voluntary and pro-active harmonisation*. Mapped onto these typologies, in Table 1, are country target/coverage of a mechanism for harmonisation, the basic reference/guidance it draws on and its aims and principal actors, and an assessment of expected convergence.

(i) *cooperative harmonisation by means of the Cartagena Protocol on Biosafety*: The Cartagena Protocol on Biosafety, as an international agreement focusing on the transboundary movement of living modified organisms (LMOs), serves as an instrument of harmonisation providing protection from potential adverse effects LMOs on the conservation and sustainable use of biological diversity, taking into account risks to human health. Its Article 14.1 allows for Parties to enter into 'bilateral, regional and multilateral agreement regarding intentional transboundary movements of living modified organisms, consistent with the objectives of this Protocol and provided that such agreements and arrangements do not result in a lower level of protection than that provided for by the Protocol' (Convention on Biological Diversity, 2000). At the time of writing some 37 African countries are party to the Protocol, meaning that they have obligations in the implementation of provisions provided for by the Protocol.

The UNEP-GEF initiative, focusing on the implementation of the Protocol, is aimed at building a 'national biosafety framework', developing policy on modern biotechnology, legal and technical documents for implementing such policy; an administration capacity for handling requests; mechanisms for public participation and awareness building; and monitoring and evaluation. The methodical approach inevitably produces some level of correspondence between systems developed on a country-by-country basis. The Protocol, however, contains optional clauses, such as the application of socio-economic criterion on GMO decisions, which means some countries could adopt it. These conditions, therefore, limit the potency of the initiative to produce compatible biosafety systems. According to an UNEP-GEF interviewee, the concept of 'harmonisation' gives the impression of centralising laws of sovereign countries. He thus prefers 'coordination' to 'harmonization' as the former is about national biosafety systems recognizing each others' products. According to this interviewee UNEP-GEF's aim is to make countries cooperate and trust each others' systems.

Table 1: Emerging typology of the African biosafety systems convergence

	cooperation	**voluntary convergence**	**proactive harmonization**
target, coverage	Country-by-country	Africa	Africa
reference & method	Cartagena Protocol on Biosafety	voluntary model legislation	Directed by AU-NEPAD secretariats
principal actor	UNEP-GEF	AU	AU-NEPAD
major purpose	transboundary movement of GMOs	ensuring social justice and maintaining biodiversity	co-development of GM technology and its regulation, intra-Africa trade
expected convergence[viii]	low-medium	low	too early to predict

(ii) *voluntary harmonisation by means of the African Model Law on Safety in Biotechnology (African Model Law)*: The AU's African Model Law is voluntary model legislation that is legally non-binding and has no relationship to any international conventions. Its key objectives are protecting biodiversity, ensuring social justice and, thereby, developing a common African position on GMOs. The African Model Law, taking the protection provided for by the Protocol, allows the use of provisions of the Protocol that are at the discretion of the Parties. Some of its provisions, most importantly its scope and criteria for making decisions on GMOs, exceed that provided for by the Protocol. For example, it suggests the application of the discretion given by the Protocol to Parties in Article 26.1 on 'socio-economic conditions':

> The Parties, in reaching a decision on import under this Protocol or under its domestic measures implementing the Protocol, may take into account, consistent with their international obligations, socio-economic considerations arising from the impact of living modified organisms on the conservation and sustainable use of biological diversity, especially with regards to the value of biological diversity to

indigenous and local communities (Convention on Biological Diversity, 2000).

Many of the interviewees regarded the African Model Law as 'too protective'. For example, an interviewee from the African Biotechnology Stakeholders Forum, noted that decisions on GMOs have to be based on 'circumstances that go beyond religious and traditional beliefs and other norms of a society'. According to this interviewee, societal views can distort an issue like GMOs. A member of AU personnel, who primarily works on biosafety issues across the continent, noted that to his knowledge not many countries showed a keen interest in adopting the African Model Law. It appears, therefore, that the chance for national systems to converge to it at this time is very low.

(iii) *pro-active biosafety systems harmonisation, the AU-NEPAD approach*. The AU-NEPAD initiative is about co-development of GM technology and regulatory institutions. It is a proactive initiative, which subsequently aims to make the emerging policy and rules mandatory across Africa. According to a senior NEPAD interviewee, whether GMO is relevant to Africa is less important, as NEPAD is pressing on 'how to harness biotechnology taking into account of the perceived risks'. To this end NEPAD has identified facilities in member countries, and is capitalising on them by setting up centres of excellence and networks (one each in Nairobi, Pretoria, Cairo and Dakar). The notions of cooperation and centres of excellence are based on an economic rationale, that African countries taken separately are too small to develop a comprehensive national capacity, as the requirements are for high quality and multidisciplinary skills and modern research facilities, and risk management structures (Gaillard, 2003). Subsequent to knowledge production, many countries, including South Africa and Egypt that are considered to have better S&T capacity (GSA, 2001; Ayele, 2005), also have limited capacity for commercial exploitation of modern biotechnology, and lack venture capital, entrepreneurial skills, and local and foreign markets. So, according to an interviewee from NEPAD, Africa has to look into expanding its own markets for producing and trading modern biotechnologies. And this entails harmonising the biosafety systems.

Although evaluation would be premature, the AU-NEPAD initiative seems to have some ingredients for success. The high level African Panel on Biotechnology (APB) is charged with developing an African strategy on biotechnology and biosafety by the highest body on the continent, AU. APB comprises an interdisciplinary team of scientists, civil society representatives, industrial managers and senior policy-makers (Chege, 2005). Most panel members are personalities well known for their passion,

intellectual rigour, and global experience; and some have supporters from a wide spectrum of views.

There is a widespread optimism about harmonization, but for different reasons. There seems to be political will on all sides. Dominant actors pursue the agenda as a means of legitimising a particular model in the domestic laws as well as reducing differences on the outcome of decisions on GMOs across the continent. As many countries have begun to institutionalize biosafety systems, harmonization is likely to produce relatively limited adjustment costs. Looking at it from an industry perspective, harmonization reduces the number and complexity of regulatory regimes, and overcomes different labelling requirements. All these reduce the cost of regulation, enhance trade and investment, reduce the cost of product delivery and perhaps reduce prices to consumers. But they also weaken the rationale for a 'case-by-case' evaluation of LMOs.

However, it follows from the analysis that barriers to harmonisation emerge as and when national standards exceed that provided for by the Protocol, are not clearly identified and specified, or have no relation to the Protocol. In the case of countries not party to the Protocol, it is possible that national standards could also fall short of the standards provided by it. While none of the interviewees suggested that harmonisation means total convergence of biosafety systems, pioneers of harmonisation should focus on standards that really matter to the key actors, consider why differences occur and how they can be harmonised.

Another challenge to harmonisation can be the disparities in African economies and resource distribution. These in effect will determine the rent distribution from harmonization. Countries have different reasons for harmonization and differing expectations. South Africa seeks to develop its biotechnology sector, but given its limited internal market (GSA, 2001) it pursues intra-Africa trade. Ethiopia, as some interviewees pointed out, is concerned about involuntary transboundary movement of GMOs, emerging from porous borders that encourage illegal trade in GMOs and/or the cross-boundary gene flow to wild species. African economies differ in size, in the distribution of their human population across activities, and the size and distribution of their genetic resources. Those with better S&T capacity are bound to reap the benefits from harmonization. It is also worth noting that much African concern about GMOs is partly to do with potential loss of genetic resources to multinational companies. Some interviewees, interestingly, noted that if Africa was to own the technology, and reap the benefits thereof, the opposition to it would be much reduced.

Conclusion

Institutionalising GMOs raises some fundamental questions, including who champions it and for what end, and whether and how actors' views and interests are taken into account. The paper showed that in the countries studied and at pan-Africa level the emerging biosafety systems are perceived as having failed to find a way through the competing views and concerns over GMOs. Analysis suggests a critical consideration of two areas: legitimation, and socio-economic needs and interests.

The process of institutionalising biosafety systems tends to be path-dependent, and institutions already debating or developing policy, or those poised to develop or evaluate a technology often start the process. However, as the case studies have brought out, some necessary factors must be present: regulatory skills and knowledge of modern biotechnology, and infrastructure for administration, inspection and monitoring. Institutionalisation could build on some of these factors, rather than reinventing the wheel. Moreover, actors' perception of the institutionalisation process is central for legitimacy. Those championing the process need to have a mandate, from national governments or the AU. The process needs to be inclusive of major actors, with different preferences, as it brings collective ownership of and accountability for action. Different viewpoints and social, professional and sectoral interests need to be brought around the negotiation table, as this provides opportunities for better understanding the issues, and enlists trust in governance and support for process implementation (Haas, 2004).

On convergence of biosafety systems, the legitimacy question has to be answered. Convergence very much depends on compatibility of systems, overcoming major disparities between economies. Countries and actors want to see how they would benefit, and understand why they should forego their own interest (should that be the case) or demand that others do. Countries with dominant players in biotechnology or industry seek larger markets for GM products. Relatively S&T weak countries are more concerned about cross-border movement of GMOs and, in the event things go wrong, about issues of accountability and redress.

The case studies showed that there is little dispute that science is the basis for risk assessment. However, systems differ as do the environments giving rise to them (political, cultural, and economic). GMOs laws too differ, notably principles applied and relationships to other domestic laws. Scientific assessment itself is based on social and political assumptions (Levidow, 2003). It cannot therefore be presumed that systems converge simply because scientific standards appear to be the same.

One key challenge of biosafety system construction and harmonisation is ensuring the making and implementation of biosafety rules connect with and represent the key actors.

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i Woldu and Demissew (2004) provide more information on biotechnology capacity in Ethiopia.

ii EPA's team of experts has been led by Dr Tewolde Gebre Egziabher – Africa's chief negotiator for Cartagena Protocol on Biosafety.

iii Representatives from public organisations dominated the SC. There were only two NGOs, namely the Ethiopian Chapter of Consumer International Network and the Institute of Sustainable Development.

iv Clearly the scope of Egziabher's views on GMOs, biosafety and patenting living organisms is much wider than Ethiopia.

v See: http://www.biowatch.org.za/main.asp?show=13 (accessed 16 June, 2006).

vi See: http://www.pub.ac.za/ (accessed 16 June, 2006).

vii See 'Southern African Regional Biosafety Program' supported by USAID at http://www.usaid.gov/ accessed 16 June, 2006).

viii Based on qualitative data assessment and scale of 1-5, low =1-2, medium = 3, and high 4-5.

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