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Seeking a Common Path:
Structuring Multistakeholder Dialogue on Agricultural Biotechnology in Africa

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Abstract

This paper analyzes an ongoing effort by national, regional, and international partners to raise awareness, promote dialogue, and catalyze consensus-building mechanisms among stakeholder groups on the role of biotechnology in agricultural development and food security in southern Africa. Stakeholders include public bodies, the private sector, and civil society. The paper argues that while responsible adoption of agricultural biotechnology promises significant gains to the countries of southern Africa, governments must clarify its specific role, improve policies for its application, and assess the place of biotechnology in broader development strategies. The issues that surround the introduction, creation, and application of agricultural biotechnology in southern Africa are complex, and the passions behind them are strong. The best chance of building consensus lies in bringing different views to the table for deliberation and information sharing, thus starting a process of collaborative planning, implementation, and evaluation of various activities. Deepening the dialogue and involving more parties has many challenges. Strong conflicts among members are to be expected, and there is a risk of dissolution of the dialogue process as a result of these conflicts and other factors such as lack of interest and shortage of resources. If stakeholders focus on the process, these obstacles can be overcome. Building trust and commitment among the members, maintaining communication, exchanging knowledge, and being open to revision of old views will help the dialogue continue and will ultimately make it more productive.

Key words: biotechnology, consensus-building, conflict resolution, Africa

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1. Introduction

Controversy surrounds both the public and scientific discussions of agricultural biotechnology in southern Africa, including the production, consumption, trade, and movement of genetically modified (GM) foods. This paper seeks to explain the sometimes-contradictory arguments that underlie the different positions taken by stakeholders on the role of biotechnology in agriculture, while exploring recent efforts to bridge them by developing a common process for dialogue and discussion. It outlines key aspects of biotechnology research and adoption, such as biosafety, trade, intellectual property rights, risk–benefit assessment, information and resource needs, and policy formulation, on which governments and civil society in southern Africa will need to reach greater agreement now and in the future.[1]

The divergent positions on agricultural biotechnology are grounded in often unacknowledged but deep-seated beliefs about technology, nature, the global order, and the meaning of development among the various stakeholders. Profound uncertainties exacerbate the differences among positions on who will benefit and who may lose from the technology, what its unforeseen consequences may be, how long it will take for the impacts to be discovered, whether the effects can be known before irreparable harm is done, and who will make the decisions. The disputes reflect politically charged issues of allocation of rights to resources, as well as distribution of the benefits, and the costs of technological change. Finding answers to these questions is further complicated by

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[1] Background papers on these topics were prepared as part of a joint initiative by the International Food Policy Research Institute and the Food, Agriculture, and Natural Resources Policy Analysis Network, discussed later in this paper. They have been collected in *Biotechnology, Agriculture, and Food Security in Southern Africa*, edited by Steven Were Omamo and Klaus von Grebmer and published by IFPRI in 2005 (http://www.ifpri.org/pubs/books/oc46.htm). The material here draws heavily on that work.

scientific uncertainty, long time horizons, and the need for decisionmaking at multiple jurisdictional levels.

Answers, however, are urgently needed. The positions taken on agrobiotechnology are not simply academic abstractions but also the foundation for government policies that affect traders, farmers, and the food insecure across southern Africa. For example, the content and character of the debate regarding appropriate responses to food crises in Sub-Saharan Africa have been fundamentally and irreversibly altered by the introduction of GM grains into the food aid pipeline. In 2002–03, although tons of food were available to meet food shortages in the region, they were initially blocked because they contained unspecified amounts of GM grain, specifically, *Bacillus thuringiensis* (*)* maize. Some governments were unsure of the implications of GM food for human health and the environment, and efforts to address their concerns pitted erstwhile partners in national and regional food relief against one another and raised the transaction costs of food relief, rendering much more difficult a range of basic tasks and operations, such as moving grain through ports and across borders. How could Malawi move maize donated by the United States, and thus containing *Bt* maize, through Tanzania in mid-2002 in the absence of complementary biosafety protocols in the two nations, and in the absence of associated testing machinery? Measures had to be taken, quickly and under extreme pressure, to address seemingly mundane issues such as how to load grain into rail cars and trucks with minimal "escape," how to cover the loaded cars and trucks, and how long to allow the loaded cars and trucks to sit in given positions. The opportunity costs associated with such logistical hurdles, coupled with the region's general resistance to potentially life-saving but GM food, elicited intense scrutiny and opprobrium from food donors and relief agencies.

The inadequate responses to the crisis of the governments in the region underscored for many in the development community the need for wider understanding of agricultural biotechnology in southern Africa. The conflict over the GM food aid that

arose, as these governments, donor countries, and international organizations attempted to address the situation revealed that, regardless of whether the aid was accepted in this case, it was imperative for the countries of the region, and indeed for all developing countries, to have a comprehensive biosafety system to scientifically evaluate and monitor the risks of GM products for their respective national contexts.

2. Starting And Supporting A Common Process

The battles over the presence of GM grain in food aid shipments starkly illuminated technological, policy, and operational gaps in biosafety and agrobiotechnology standards and procedures. At a meeting of the Southern African Development Community (SADC) Council of Ministers for Food, Agriculture, and Natural Resources (FANR) on July 5, 2002, in Maputo, Mozambique, representatives noted that the lack of a harmonized (regional) position on genetically modified organisms (GMOs) was creating serious operational problems in the movement of food and nonfood items. Consequently, the council advised member states to engage in bilateral consultations and to explore mechanisms to facilitate movement of humanitarian aid in the form of food that might contain GMOs. In 2003, the FANR ministers approved the establishment of an advisory committee on biotechnology and biosafety to develop guidelines to safeguard member states against potential risks of GMOs in the areas of trade, food safety, ethics, consumer concerns, and contamination of genetic resources (SADC 2003).[2]

More broadly, African leaders have resolved to build regional consensus and strategies to address concerns emerging with advances in modern biotechnology,

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[2] In August 2003, SADC approved a set of recommendations formulated by the advisory committee as interim measures aimed at guiding the region on issues related to handling food aid, policy and regulation, capacity building, and public awareness and participation.

including genetic engineering. In 2003, the African Union (AU) and the New Partnership for Africa's Development (NEPAD) called for the development of a common African position on biotechnology,[3] a resolution followed by the formation of a high-level panel of experts and opinion leaders, the African Panel on Biotechnology (APB) in July 2005. The panel is charged with preparing a comprehensive African strategy and a common position on biotechnology, including applications for agriculture, health, the environment, mining, and manufacturing and to advise on current policy issues associated with its ethical, social, regulatory, economic, scientific, environmental, and health aspects.

In parallel, at the beginning of 2003, the International Food Policy Research Institute (IFPRI) and the Food, Agriculture, and Natural Resources Policy Analysis Network (FANRPAN) embarked on an initiative to engage multiple stakeholders with concerns about agricultural biotechnologies. This highly participatory process involved high-level policymakers, senior representatives of a range of stakeholder agencies, and respected scientific leaders, who came together for an integrated series of roundtable discussions. The first policy dialogue took place in April 2003 in Johannesburg, South Africa; a subsequent dialogue took place in Harare, Zimbabwe, September 20–21, 2004, sponsored jointly by IFPRI, FANRPAN, and NEPAD's Science and Technology Forum.

The IFPRI-FANRPAN-NEPAD initiative has established the opportunity for multistakeholder participation in a process of finding and maintaining a dynamic balance between political and technical priorities on agrobiotechnology. In this process, civil society can provide expertise and creative thinking to help identify needs, generate innovative policy options, and implement agreements, while governments retain their

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[3] The Executive Council passed Decision EX.CL/Dec. 26 (III) at the AU Summit in July 2003 in Maputo, Mozambique.

preeminent function of ultimate decisionmaking. The aim of the dialogue should not be to develop consensus per se but rather to agree on the character of the process that the countries and the region need to move toward consensus. Encouraging strong communication, sharing information, and developing trust among the participants will better enable them to withstand differences that emerge.

Ultimately, governments in the SADC region and their development partners have the potential to expand existing dialogues at the national and regional levels and to initiate new ones. Paying equal attention to the process and to building relationships for achieving anticipated outcomes is important, because no single, unified approach exists that can be adopted in all contexts.

3. Domains of Difference

Understanding the foundations of differences among informed stakeholders is crucial, because the relatively uninformed, either by design or by default, often rely on the relatively well informed for guidance. The problem becomes more complex when there are grave discrepancies among the relatively well informed (in the United States and the European Union) on how to proceed and when these stakeholders try to persuade the relatively uninformed to follow their respective lines of reasoning in dealing with this technology. Furthermore, although debates about agricultural biotechnology may appear to be only about the level of protection given the environment or about the procedures and regulations countries must follow, they actually reflect more fundamental values.

Differences among informed stakeholders in the debate on biotechnology in agriculture take three key forms: disciplinary approaches, paradigms about science and technology, and political perspectives, all of which run through and underpin the deepening controversy surrounding the role of GM food in meeting southern Africa's

food shortage. Moving toward consensus on agrobiotechnology requires exploring and finding common ground among these strongly held beliefs.

Conflicting Disciplinary Perspectives among the Biophysical Sciences, Social Sciences, and the Humanities

The experiment-based, hypothesis-testing approaches that typically characterize the biophysical sciences contrast with those in the social sciences, which are more concerned with collective behavioral hypotheses in which both theory and data give greater emphasis to context, while providing less certainty about causal relationships. Increasing use of experimentation in the social sciences holds prospects for bridging this particular disciplinary divide. But it reinforces another, namely that between the sciences on the one hand and the humanities on the other. The reductionism that drives model building and hypothesis testing in the sciences is negated in the humanities, where explanation is often built on narrative depictions of dialectic tensions between individual agency and societal determinism.

Competing Paradigms about Science and Technology

Divergences defined by alternative disciplinary perspectives are further accentuated by a more fundamental conceptual (paradigmatic) clash surrounding the role of science and technology in human development, which pits modernists against postmodernists. Modernism is predicated on beliefs that science and technology yield outcomes that are positive and beneficial and that, with scientific and technological advances, human progress and development are inevitable and good. For modernists human history is captured in global, culture-neutral theories and patterns ("metanarratives") in which levels and rates of scientific and technological advance are decisive, and in which agency and power reside primarily with countries and peoples occupying prominent positions on scientific and technological frontiers. Postmodernism is largely a reaction against the assumed certainty of scientific, or objective, efforts to explain reality. For postmodernists, reality is constructed, knowledge is subjective, and

interpretation is everything. Change and the passage of time – not progress and development – are the only certain outcomes of scientific and technological advances and human history. Scientists can thus no longer stand apart from society but must be willing to share the burden of finding solutions to the risks imposed by their inventions.

Divergent Political Myths between South and North

A third divisive force in the debate on biotechnology in agriculture relates to political mythmaking—ideas about the dominant global political order in the South versus those in the North. In the South, a significant thread of political mythmaking holds that the South is being exploited by the technologies of the North, as expressed in a statement such as "This biotech thing is just another way for these 'Northern' people to make themselves richer—to make us more dependent on them. If the Europeans and Americans want to fight over who will get richer from biotechnology, then they should not use us as proxy battlegrounds." In the North, despite sustained efforts toward greater inclusion and participation of "southern" voices in development policy formulation, paternalistic themes remain, echoes of 19th century ideologies captured in the imperialistic stance of the "white man's burden."[4] These are audible in statements such as "We cannot turn our backs on millions of hungry people. Our future is intimately tied up with theirs. Luckily we have answers to their problems. The challenge we face lies in helping them—in helping their leaders—make the right choices."

4. The IFPRI-FANRPAN-NEPAD Initiative

The objective of the initiative is to facilitate and guide dialogue about agricultural biotechnology using a participatory mechanism that will allow for these underlying

[4] "The White Man's Burden" is the title of a poem written by Rudyard Kipling in 1899 that appealed to the United States to assume responsibility for developing its territory of the Philippines; the phrase came to symbolize an ideology supporting imperialist efforts.

differences to be addressed while increasing awareness and catalyzing consensus about process, and eventually, about locally appropriate policies.

The initiative first promoted by FANRPAN and IFPRI and joined by NEPAD establishes a carefully managed but highly participatory process that draws on a method known as technology assessment (TA).[5] It involves 40–50 participants; of these, 30–40 are stakeholders (high-level policymakers, senior representatives of a range of stakeholder agencies, and respected scientific leaders), 5–10 are technical and subject matter specialists, and 5–10 are organizers. They have been brought together for an integrated series of roundtable discussions on biotechnology, agriculture, and food security in southern Africa. Two interlinked roundtable gatherings have been held. A steering committee (SC) was appointed at the first meeting, with membership drawn from among the invitees. The SC, supported by a working group drawn from the convening institutions, determines the format, content, and participation of the meetings. To further ensure impartiality, FANRPAN and IFPRI decided that the first workshop would be funded only by IFPRI resources and established a governance structure that was both transparent and public.

The aim of the initial workshop was to foster broad participation and open debate on clearly defined questions under procedurally fair conditions. Key challenges revolved around ensuring that all relevant parties were involved, accurate scientific information was made available, links with official decisionmaking bodies were promoted, and

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[5] Technology assessment (TA) was developed by the U.S. Congress in the 1970s to provide its members with access to independent, objective, and competent information on scientific and technical issues, so that the process of making political choices among viable alternatives could be better informed. Since then, the concept of TA has evolved further, largely in developed countries outside the United States. Wider stakeholder participation has been incorporated to better integrate varying interests and values. Questions of power, influence, and responsibility arise explicitly and are confronted (Daele, Pühler, and Sukopp 1997; Australian Museum 1999; Calgary 1999; Nentwich 1999; Goven 2001). Some of these features have been attempted in developing countries in Africa (Thamy 2002) and in South America (REDBIO 2001).

fairness and efficiency were recognized and embraced as evaluation criteria. Background papers were prepared for the first meeting in Johannesburg (Omamo and von Grebmer 2005),[6] and additional studies by scientists selected by the SC have been written for subsequent meetings. The goals for the final meeting are to identify consensus recommendations (that is, a resolution or declaration), and, if relevant, outline an appropriate follow-on action plan.

Anticipated outputs from the process of policy dialogue include greater awareness of, dialogue about, and consensus among key national and regional policymakers and policyshapers on

1. Central gaps and priority constraints in agricultural biotechnology;
2. Central policy trade-offs associated with GMOs in southern African agriculture;
3. Alternative institutional and organizational arrangements governing biotechnology in agriculture and the potential consequences for national and regional responses to food crises and chronic food insecurity;
4. Recommendations (ideally in the form of a resolution or declaration) to enhance the ability of national and regional policies, programs, and regulations governing agricultural biotechnology products to spur agricultural growth and food security while ensuring protection of human health and the environment; and
5. An action plan for strengthening institutions and policies governing biotechnology in southern African agriculture, including an agenda for regional research, capacity strengthening, and outreach.

The Southern African Context

In today's globalizing economy, a country, particularly a developing one, will not be able to survive unless it adopts or accommodates genetic engineering in agriculture.

[6] These papers have been collected in Omamo and von Grebmer (2005).

To compete internationally, it will have to adopt biotechnology for production. For many countries, not investing in biotechnology may also mean greater environmental degradation and food insecurity. Avoiding agricultural biotechnology is no longer an option, because developing-country institutions have been conducting research on the technology for almost two decades in some cases and have developed products that are transforming regional agricultural production, trade, and consumption. Countries will find it difficult to keep GM crops from crossing their borders as international economic agreements and world trends pressure them to accept the products.

Although the southern African region is not far along the road of biotechnology development and assessment, the process is moving forward. Modern biotechnological techniques are being employed in only a few southern African countries: Malawi, South Africa, Zimbabwe, and to a lesser extent Mauritius and Zambia. Of these countries, only South Africa has reached the commercialization stage for genetically engineered goods. The others have either only recently approved contained crop trials or do not yet have the regulatory or scientific capacity necessary to conduct such trials.

The adoption of agricultural biotechnology has changed the debate on how long-term agricultural growth and food security can be achieved with technological advances in agriculture. To many stakeholders, both in the region and outside it, GM food aid signals an imminent likelihood of GM crop production. And, while some welcome this prospect, others resist it. Both groups share concerns about the numerous uncertainties regarding the relevance, efficacy, sustainability, and safety of the technologies.

5. Key Issues to be Resolved

Against this background, several priority issues have been identified for discussion and resolution: biosafety policies and frameworks, trade, protection of

intellectual property, risk-benefit assessment, information and resource needs, and the policy formulation processes, each of which are discussed here.

Biosafety Policies and Frameworks

The debate over GM food aid exposed a critical problem: the majority of countries in the SADC region lack the regulatory and scientific assessment structures necessary to take decisive steps on biotechnology. Only three countries in the region—Malawi, South Africa, and Zimbabwe—have legal mechanisms for biosafety. Systems elsewhere are still emerging. Most countries have not prioritized development of biosafety regulatory structures because of the low level of their biotechnology research and development. If lessons from the 2002 regional food crisis are any guide, the countries in the region are best advised to put regulatory and scientific monitoring mechanisms in place, because GM products may enter the region not as products from local research but from trade in such products developed elsewhere. The food aid controversy underlined the fact that in a globalized economy the development of biosafety regulations is not a luxury but a necessity. For the long term, the SADC countries will benefit from the regulations already created since they provide an enabling environment and monitoring mechanisms for biotechnology research and development and the use of GE products. A particular challenge for each country will be harmonizing regulations among their different public agencies, with other countries in the region, and with international agreements.

Opportunities exist for the SADC countries to collaborate, share information, and create synergies through dialogues. The nations with systems in place can share their experiences to encourage learning and adaptive implementation. That all the countries are signatories to the Cartagena Protocol could facilitate harmonization among the biosafety frameworks of the different countries for the transboundary movement of GMOs.

Some of the goals of such a dialogue would be

- To debate and come up with solutions for harmonizing regional policy on biosafety,
- To link biotechnology and biosafety with trade policy, and
- To examine the missing links between national and regional policy approaches and determine which issues can best be addressed regionally versus nationally (Mnyulwa and Mugwagwa 2005).

In creating biosafety frameworks, regional stakeholders need to consider their respective economic, social, and cultural contexts. They would benefit from a critical examination of the dominant approaches to biosafety in the world, namely those of the European Union and the United States, the latter of which is used as a model in international development circles. Whereas in the European Union modern biotechnology spurred the development of new regulations, in the United States scientists and regulators relied on the country's existing regulatory structure, instead of creating new laws. It is important that the southern African countries become knowledgeable about the U.S. Food and Drug Administration's policies and their scientific, legal, and political bases to engage in discussions and negotiations on biotechnology on a more equal footing.

These approaches, while instructive, may not be entirely appropriate for the SADC countries. The U.S. experience, for example, illustrates the hazards of developing biosafety frameworks not attuned to local food habits and economic and health conditions. U.S. agencies did not take these considerations into account, asserting that GM crops are safe for all populations, although this assertion had not been tested. The population of southern Africa consumes different foods, uses different food processing methods, and relies on staple foods, such as maize, for the majority of their caloric intake. Furthermore, the high prevalence of morbidity, malnutrition, and compromised immunity due to HIV has to be considered when testing GM products in the region. As more

complex GM foods are developed, these contextual factors will require even greater attention. To feel safe, people in the region need assurance that their safety, health, and beliefs have been taken into account as far as possible before new forms of food products are introduced. Southern African countries can consider other countries efforts in identifying the most appropriate institutional and procedural mechanisms to use to reach judgments, to identify policy choices and trade-offs relevant to their region, and to develop policies of their own.

Key aspects of a biosafety framework would include the following:

- Legislative frameworks that include provisions to address trade-offs across public agencies in various sectors (for example, agriculture vs. health vs. the environment) and stakeholder groups (farmers vs. consumers);
- Clear criteria for selecting products to be regulated;
- Unambiguous requirements for transparent state action and enforceable provisions for vigorous public involvement;
- Rigorous risk–benefit assessment and management; and
- Communication with stakeholders on national biotechnology strategies and policies.

In addition, to reduce the potential food safety risks of GM food, governments can call for

- Mandatory procedures for evaluating food safety, potentially including pre-market testing of new products;
- Greater standardization of testing methods and decisionmaking criteria;
- Utilization of newly emerging broad-spectrum profiling techniques to detect unintended compositional changes; and
- Consideration of the diverse contexts in which a given GM product may be consumed when developing, testing, labeling, and exporting or importing GM foods.

Greater investment in regional capacity- building is essential. First, governments and other stakeholders can identify the capacity gaps and determine which gaps require immediate attention and which can be addressed later. Improved skills and knowledge will be needed in the areas of scientific research, regulation, legal services, and policy. Capacity-strengthening strategies for biosafety will have to be prioritized and must be realistic. Core scientific capabilities and infrastructure are required for research on GM crops and, regarding biosafety, on biotechnology product evaluation, risk–benefit management, inspection, and monitoring. Given the differences among the countries in terms of biosafety development, there could be benefits to creating regional actions to coordinate cross-border capacity building. The SADC is well poised to provide leadership in this area. Regional coordination of efforts for creating effective regulatory systems, including their harmonization, will also improve regional economic activity and food security.

In creating biosafety policies, member countries and the SADC should

- Develop strategic action plans on selected aspects of biosafety policies;
- Design national policies and actions than can be extended into regional and international arrangements;
- Review resources to ensure that commitments will allow biosafety processes to be sustainable;
- Review existing biosafety mechanisms, infrastructure, and the human resource base to determine which functions can begin immediately and which can be phased in over time according to a schedule;
- Promote regional efforts to enhance biosafety research and testing to reliably inform regulatory authorities and other regional decisionmaking structures in order to facilitate movements and trade involving GMOs;
- Invest in systems for the retrieval and exchange of relevant information to establish national and regional biosafety information nodes for storage;

- Adopt legislation and regulatory mechanisms that are sufficiently flexible to account for the dynamism of biotechnology and biosafety and for their rapid development (Ushewokunze-Obatolu 2005).

Facilitating Trade

Biosafety issues are closely linked to trade matters because GM products constitute an increasing portion of exported and imported goods in the global economy. As participants in world trade, all southern African countries will need biosafety policies capable of evaluating GM products entering the country for environmental and food safety. Harmonizing the biosafety regulations of the different countries makes sense, and regional similarities in economy, ecology, and food habits would ease the process. However, the World Trade Organization (WTO) is putting pressure on countries to harmonize their policies with its own regulations. Compatibility with regional and WTO standards would facilitate trade for these countries, but each country should be able to establish regulations that meet its own needs and goals.

Biosafety guidelines are absolutely necessary if southern African countries wish to develop and export genetically engineered agricultural goods. In fact, there are fears that because the traditional exporting nations have adopted biotechnology, they will increase their exportable surplus and depress world prices, which would make other, nonadopting producers, such as those in African countries, less competitive.

On the one hand, introducing agricultural biotechnology provides an opportunity for poorer countries to produce higher yields, lower their production costs, and become a source of cheap agricultural exports. On the other, these benefits for SADC countries may be at the cost of reduced access to key markets, especially in Europe, where consumer sentiment against GMOs is likely to remain high well into the future. Individual countries, and the region as a whole, must find ways to resolve this tension.

Different consumer preferences in the world regarding GM foods—and, as discussed earlier, the environmental, social, and health conditions and food habits in southern Africa—indicate that it would make the best sense for the SADC countries to develop biosafety and trade policies that suit their respective needs, despite pressure from the WTO to conform to its guidelines. In reality, the contention over the trade in and safety of GMOs has been caused by the lack of an international standard. For better or worse, this has given WTO member countries room to adopt trade-restrictive measures on GMOs. For example, the WTO recognizes environmental concerns, but thus far these concerns have not been tested in a legal dispute. Although the Cartagena Protocol on Biosafety, to which all the SADC countries have acceded, is an international agreement on procedures for the safe transboundary movement of GMOs, it is not clear whether the WTO will recognize the protocol's regulations. Finally, the WTO currently focuses on environmental safety. The safety of GM foods, another vital issue, is one about which the WTO treaty regulations remain undeveloped.

The harmonization and rationalization of national and regional policies on biotechnology and biosafety is a goal that the governments and other stakeholders in the countries of southern Africa should and can achieve, particularly to facilitate the smooth movement of GM material within the region, whether for commercial or noncommercial purposes. The first step must be to clarify national guidelines among the different ministries. The SADC countries should harmonize their policies and procedures for standard setting and enforcement, risk–benefit assessment and management, prior informed consent, and information and documentation.

The potential economic benefits that GM crop production might bring to small farmers and food security in SADC countries is not, however, a panacea that will resolve the trade-related difficulties the region faces (Mupotola 2005). If the area fails to address the export subsidies and protected markets in developed countries and their adverse

effects on developing countries, few benefits will result. It is within the SADC's interest for member countries to act as a cohesive group and participate fully in areas of mutual interest during negotiations of international agreements, especially the WTO agreement. If they could influence the world trading system overall, the SADC countries would not have to rely solely on preferential market access opportunities.

Protection of Intellectual Property

In the southern African region, the value of intellectual property rights (IPRs) in development is only minimally appreciated. Governments in the region need to determine what level of protection they require to support biotechnology innovations. If governments start to procure technologies, they should consider conforming to the provisions of the Trade-Related Aspects of Intellectual Property Rights Agreement. For their own benefit, they will also need to decide on the desired extent and use of IPRs and determine the cost implications (Olembo 2005).

A country not currently growing GM crops may decide to do so and will need to choose whether or not to develop the technologies themselves, although few African countries have the resources to develop their own large biotechnology programs. If southern African countries decide to obtain the technologies of outside multinational research companies, they will need greater clarity in their IPR policies, since, despite having already acceded to one or more regional or international agreements on IPRs, most countries in the region still lack clear-cut policies. Strong IPRs can provide the incentives private companies require to sell their technologies. Advocates of protective IPRs argue that a country can make advances in agricultural growth and food security as a result of these technologies. Regardless of their choice to go forward independently or to lease technologies from outside, governments will need to articulate clearly the protection to be granted to breeders and to small farmers and resources in the country.

Countries in the region may develop legislation that protects the rights of farmers as well as indigenous knowledge and resources. In response to the International Union for the Protection of New Varieties of Plants agreement, in 2002 the Organization of African Unity published *The African Model Law* to protect the rights of local communities, farmers, and breeders and to regulate access to biological resources. This document was developed as a model for African national laws, but to date no such laws have been enacted. IPRs should be coherent and should balance the rights of the innovators with those of the poor while also reflecting each country's needs and development goals.

The Complexities of Risk–Benefit Assessment

Several aspects of the southern African context need to be considered together in determining whether biotechnology has a role to play in development and precisely what positive effect it is expected to have. There is continued uncertainty about the possibility and seriousness of both food safety and environmental problems resulting from GM products. At the same time, food insecurity is a major problem in the region and will remain so. GM crops may help alleviate hunger and malnutrition, but to what extent and how much is unclear, especially if the underlying causes of these problems are not simultaneously addressed.

Given these uncertainties, what policies should southern African governments pursue? Both GM-inclusive and non-GM policy options are available that could help to reduce household food insecurity and malnutrition, and to reduce sickness, especially among vulnerable groups such as women and children. What are the potential benefits, risks, and costs associated with the policy options in each group? Can GM agriculture contribute significantly to improving food security and nutrition in southern Africa without creating unacceptable risks to food safety and the environment? These are questions that the governments, farmers, consumers, and private-sector and other stakeholders in the region will have to address together.

The disciplinary, paradigmatic, and political principles outlined earlier in the paper are clearly revealed in discussions of risk–benefit assessment. A view that many critics of biotechnology have expressed is that a technological solution is being advanced to solve problems that at root have political and economic causes. Non-GM policies to eradicate hunger and malnutrition have been implemented and successful when they were designed to suit local contexts, were well managed, and received the requisite levels of political, institutional, and economic support. There is also concern that with the use of biotechnologies, these basic and necessary policies may be neglected. That food security depends on the broader foundation of good governance, peace, rule of law, respect for human rights, and equity in development is increasingly recognized.

If GM technologies are adopted, their positive impact on malnutrition and food insecurity will in part depend on the continuation and expansion of the "conventional" programs that have also been implemented to achieve these ends and to improve governance. For example, iron and pro–vitamin A (beta carotene) in plants have very low bioavailability, so enhanced levels of these nutrients in GM foods may have little or no impact unless the quality of overall diets is also improved. Improved household food security through GM agriculture—if achieved—will not reduce child malnutrition unless governments also invest in programs for child health, child care, and child feeding, all of which poor women have difficulty providing due to their own poor health, nutritional status, and lack of knowledge, as well as time demands.

In addition to assessing the risks and benefits of GM policies for health and nutrition, compared with non-GM policies, environmental issues are also a major concern and reflect a similar disjuncture on basic approaches. One view asserts that developed countries face a compelling moral imperative to make GM crops readily and economically available to developing countries (Nuffield Council 1999). Others who also support the technology argue that governments and the scientific community have a duty to ensure that it is made available in a responsible way. Still others, more distrustful,

believe society has an obligation to ensure that appropriate legislation and regulatory frameworks are in place and risk–benefit assessments have been carried out before the technology is introduced. These fears about "playing God" and risking unforeseen negative consequences for humans and the environment are as strong in southern African societies as they are in Europe. At stake are different paradigms of human progress and the role of science and technology in human development. In the words of the Nuffield Council, "Proponents of the technology citing practical benefits may have an intrinsic value system that views science and progress as good things in themselves, and opponents may be analysing risks from a world view that questions the rightness of technological progress." Principles of justice are embedded in concerns about who will reap the benefits of agricultural biotechnologies and who will bear the risks. Indeed, it is not difficult to comprehend why the reactions have been so strong on all sides and why stakeholders inject their positions with their fundamental values (Kinderlerer and Adcock 2005).

Risk–benefit assessment is further complicated by the lack of long-term studies and verifiable data. Although GM proponents in the U.S. government and some outside it claim to be using "sound science," the evidence reveals that the conclusions on the safety of GM crops have been backed up more by appeals to institutional authority than by adherence to the principles of scientific investigation (Pelletier 2005). Pelletier's findings are important and troubling, if not entirely surprising; they have wide and major implications. Academics have become aware that ideologies may underlie even the most "objective" scholarship, while people outside academia have also lost faith in pronouncements that claim to be scientific. A multistakeholder dialogue therefore needs to include these issues in its agenda, to search for clarification and resolution, and to find and maintain a dynamic balance between ethical and technical priorities.

Information and Resource Needs

A key problem in the debate over biotechnology is the existence of false information and misrepresentations, causing conflicting claims to arise that only make decisionmaking more difficult. Two general types of information are critically important:

- Information on the technology itself, and
- Information on how the dialogue could increase awareness and participation and improve information sharing among its members.

A dialogue at the national or the regional level in southern Africa should be continually informed about the major developments in agricultural biotechnology and their applications in the region. This should include information on the likelihood, frequency, magnitude, and distribution of the various outcomes from GM agriculture, and also information on the policy options for reducing the negative outcomes and enhancing the positive, based on the best available scientific knowledge and knowledge of local contextual features. To make decisions that society would accept, it will also be important for those engaged in a dialogue process to obtain and consider information on the social values attached to each of these outcomes by various groups, the level of uncertainty associated with various outcomes, the social values attached to that uncertainty, and the policy options for reducing or coping with the uncertainty. Greater awareness, dialogue, and consensus on alternative institutional and organizational arrangements for governing biotechnology are also needed. Working toward solutions will be easier if participants use a process of "joint fact-finding" to produce a common understanding of the likely effects, benefits, and costs associated with alternative policy options and generate its own information by monitoring research activities or the policies implemented.

The most critical information for southern African stakeholders and policymakers is on the benefits and risks that biotechnology would bring to their region, and only long-

term scientific research can provide answers on these issues. But there is a dilemma here: short- and medium-term action is needed for food security in the region, but long-term research is needed, too. The ethical issue of the need to address the hunger that exists today cannot be avoided. However, there are currently knowledge gaps related to GM crops and biosafety, making uncertainties pervasive, especially those related to markets. A stakeholder dialogue can guide the research process by clarifying the different questions that need to be answered. By taking these questions and finding ways to jointly frame them for the research community, dialogue participants can generate the information they need to reach consensus on policy measures.

Pelletier (2005) notes that some scientists in the biotechnology debate have been deciding how much and what type of uncertainty should be tolerated by society, and (together with regulators and politicians) discounting or misrepresenting these uncertainties in communications with the public. The appropriate role of scientists, especially those working in public research institutions, is to reduce the level of uncertainty through research and improve the methods available to test for adverse outcomes. Unfortunately research of this type has often been neglected in the case of agricultural biotechnology. In part this reflects the low value researchers, their institutions, and funding agencies place on unintended consequences. Scientists in southern Africa can avoid this mistake. Indeed much more needs to be known, such as the nature of the relationship between GM crops and soils or the impact of climatic conditions on ecological safety, which environmental scientists say is very important.

Concerted efforts to formulate and implement biosafety strategies, policies, and regulatory systems require reliable and sustainable streams of financial resources, especially to meet the heavy burden of capacity strengthening. If the SADC countries choose to develop innovations in biotechnology—and some are already doing so—they will also need to invest in research over a long time frame and in a steady manner, either individually or collectively. Multilateral and bilateral donor support is likely, particularly

if there is a clear definition of and broad acceptance of the national and regional needs and priorities.

Policy Formulation

Finding the will to address biotechnology issues is the most important step for policymakers, followed by the strengthening of national and regional capacity in scientific research, policy design, and policy implementation; risk–benefit assessment and risk–benefit management; and management of institutional processes that support these activities. Emerging areas for attention include policy analysis and development capacity for biosafety, including trade issues and strengthening of legal expertise and regulatory knowledge on agrobiotechnology topics.

Given the varying levels of capacity and resource endowment in individual SADC countries, structures and mechanisms for collaboration are needed to facilitate the pooling of resources. Governments must develop strategic arrangements for technology transfer and expertise sharing with relevant private and nonprofit organizations both within the region and elsewhere in the world, taking care to clarify issues related to intellectual property rights and commercial confidentiality. In addition to regional bodies of the SADC and governmental organizations, NGOs can play a valuable role in strengthening national and regional capacities to make informed decisions on biotechnology. The aim should be self-sufficiency in all but the most specialized abilities to place the region on an even footing with the developed world in discussions and negotiations on biotechnology issues.

Information on processes of policy formulation on biotechnology and the role of the different stakeholders in these processes is particularly lacking. Understanding of the institutional and political context within which science and technology policy is made in Africa, especially with respect to biotechnology policy, is especially weak. As more

meetings on biotechnology are held in Africa, a larger database is being created. Those participating in the dialogue could benefit from and add value by analyzing these processes and drawing lessons for themselves and others.

6. Leading the Multistakeholder Dialogue

The IFPRI-FANRPAN-NEPAD initiative on agricultural biotechnology is based on a vision of catalyzing an expanded and sustained region-wide dialogue among the national governments, regional bodies, the international agricultural research and donor community, as well as organizations of farmers, the poor, consumers, and environmentalists on the future of the technology and of biosafety in southern Africa. This multistakeholder process is anticipated to generate cooperative action for ensuring the safety of the region's population and environment and to pursue biotechnology-led agricultural development responsibly. A dialogue process will assist the countries of the region in assessing the benefits and risks of biotechnology for their respective cultures and the environment.

To achieve its goals, the dialogue process will need to conceive of the effort as a multistakeholder process from the start and to recognize the challenges facing such processes. Multistakeholder dialogues are based on the notion that the parties in negotiation almost always have both competing and complementary or compatible interests. The challenge is to structure the negotiations so that these common interests are allowed to emerge and serve as the basis for a mutually beneficial resolution. In short, the negotiation becomes a joint discovery and problem-solving exercise. The key is to focus the discussions on the needs and interests of the stakeholders and the reasons underlying their positions (Matz and Ferenz 2005).

Recent work makes clear that there are essentially four challenges that must be met by any multistakeholder dialogue on this topic:

- Ensuring that all the relevant parties are involved in negotiations,
- Getting accurate scientific and technical information on the table,
- Promoting links with official decisionmaking bodies, and
- Establishing fairness and efficiency as criteria for evaluation of multistakeholder processes.

In southern Africa, the debate on agricultural biotechnology is still confined to a very small and select group of stakeholders. To achieve a genuine dialogue at the national or the regional level in southern Africa, organizations representing farmers and the rural poor, including women and consumers, will have to be engaged. A key challenge will be to help these groups to familiarize themselves with the technical issues at hand so that they can meaningfully participate in the dialogue. Overall, the negotiation process must be accessible and transparent. Organizations in civil society can provide creative thinking and generate innovative policy options, but they also need to have the requisite capacity to participate actively in the deliberations. Uneven participation is a common problem in such dialogues, and capacity constraints are one of the major obstacles to effective participation, particularly when participants with vastly different levels of resource endowment meet together. For the voices and recommendations of members of community-based organizations and NGOs to be taken seriously, they must be well prepared, well organized, and able to remain in the dialogue over a long period of time. To achieve this goal, they need resources and access to adequate, appropriate, and understandable information.

Although the outcomes of a multistakeholder dialogue are typically not legally binding, the process can complement established decisionmaking channels. Decisionmakers have to become engaged if the greater understanding of the issues achieved by the dialogue will be translated into improved policies. Finally, monitoring and evaluating technologies and the regulations designed for them is essential, as well as

monitoring and evaluating the dialogue process itself, through engaging the participants, giving each group an equal voice, and achieving results.

As noted earlier, the aim of the dialogue is to agree on the process that the countries and the region need to adopt to move toward consensus, rather than to develop that consensus. If the focus, instead, is on ensuring a good process, consensus outcomes will be generated along the way, which in turn will provide stakeholders with an incentive to continue participating in the dialogue.

To agree on a process, stakeholders will more specifically need to do the following:

- Resolve to have a learning experience;
- Bring those who are not involved in the dialogue to the process (particularly farmers, consumer groups, and organizations in civil society or NGOs);
- Build consensus on the kinds of issues that are on the policymaking agenda and communicate those issues to those who are responsible for policymaking;
- Develop a clear set of activities and output as well as indicators to measure progress from the first dialogue to the last;
- Establish strong, collaborative relationships;
- Create a strong, cooperative group that can support the development of policy in local areas; and
- Consider constructive linkages between the policy dialogue and other dialogues addressing the long-term food security of the region.

No single and unified approach exists that can be adopted for any context. Multistakeholder dialogues are nonlinear and iterative in nature, with a continually changing agenda and without a predetermined outcome. Stakeholders have to manage the complexity of the issues as they move through the process. Thus they need to have contingent approaches that recognize institutional and political conditions and the

opportunities and constraints these conditions may imply. Developing strong communication, information sharing, and trust among the participants will better enable them to withstand differences that emerge.

Awareness building on biotechnology across the general population is vital, because people have a right to know how the technology might affect their lives. Today, misconceptions exist at all social levels. An informed society will influence national policymaking and research on the issue for the better. Civil society groups in the SADC countries and networks among them may be used to disseminate information. Countries with low levels of public awareness activities may be able to work together, as many of the issues and contexts for awareness building are regional in nature. Educating the population, particularly the poor, will help strengthen the capacity and knowledge base of farmers and consumers for participation in the process.

Identifying “best practices” on ways to generate and share information can make awareness-building efforts more successful. The dialogue participants could assemble and examine current public awareness activities on biotechnology by member countries. Those involved in national dialogue processes could link with one another to share information on communication strategies and explore how national and regional networks and civil society and research organizations have disseminated their findings.

Another challenge faced by the dialogue process is managing the tension between identifying the need for new research and information while also addressing emerging urgent issues, such as those relating to biosafety and trade of GM crops and foods. There appears to be consensus about the need to deal with these issues, whether out of a desire to protect the environment, farmers, or consumers; in response to the GM food aid controversy; or as a step in examining how national regulations can be harmonized with international agreements.

7. Conclusion

This paper has argued that responsible adoption of agricultural biotechnology promises significant gains to the countries of southern Africa, even as governments need to clarify its specific role and improve policies on its application and assess the particular role for biotechnology in their broader development strategies. The issues that surround the introduction, creation, and application of agricultural biotechnology in southern Africa are complex and the passions behind them are strong. The best chance of building consensus lies in bringing different views to the table for deliberation and information sharing and the potential for starting a process of collaborative planning, implementation, and evaluation of various activities. Deepening the dialogue and involving more parties has many challenges. Strong conflicts among members are to be expected, and there is a risk of dissolution of the dialogue process due to these conflicts, lack of interest, shortage of resources, or other factors. What will enable it to surmount these obstacles and continue will be a focus of the stakeholders and facilitating organizations on the process. Building trust and commitment among the members, maintaining communication, exchanging knowledge, and being open to revisions of old views will help the dialogue continue and will ultimately make it more productive.

Some parties express skepticism that this type of dialogue is too time-consuming, too precautionary, and even insensitive to the poor. But a process of this kind will offer a broader view of the issues and of development, food security, and poverty alleviation; it ensures that participants receive reliable knowledge on the benefits and risks of the technology. By working carefully and collectively, the process will be more open, transparent, inclusive and accountable, and sensitive to the normative dimensions of the issues so critical to the participants. The themes and process outlined here set the stage for the discussions, internally and among countries, that will shape the policies on agricultural biotechnology in the region. If the dialogue can frame the discussion and be enriched by the information generated from actions taken, it can sustain the interest and

commitment of the stakeholders and more successfully direct biotechnology toward reducing hunger and poverty in the region.

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