

## Lessons and Recommendations

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Klaus von Grebmer and Steven Were Omamo

**B**iototechnology, like a host of other complex and multidimensional issues in the development field, has been characterized by marked conflict between different ethical and ideological perspectives. What has contributed to making the differences so entrenched are the profound uncertainties regarding 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. With these questions remaining by and large unanswered, different deep-seated beliefs about technology, nature, the global order, and the meaning of development on the part of the various stakeholders have come into play, increasing the intensity of the dispute and making it seem irreconcilable at times.

In today's globalizing economy, a country, particularly a developing one, will not be able to survive unless it adopts or accommodates to genetic engineering in agriculture. If it is 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. It can no longer even be considered 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 already fundamentally transforming agricultural production, trade, and consumption. At the very least, a country will face difficulties in seeking to keep genetically modified (GM) crops and foods out of its borders as international economic agreements and world trends pressure it to accept them.

Biotechnology has the potential to be a key driver of development, poverty alleviation, food security, and natural resource conservation in the developing world

if practiced responsibly. And while questions remain about for whom and for what biotechnology will ultimately be employed, more immediate and pressing ones exist, the answers to which in fact must be pursued in a concerted and collaborative manner if we are to ensure that the technology benefits and does not harm society and the earth. Some of the questions are these: What biosafety regulatory frameworks should be established? What policies are required to guarantee that the production of GM crops serves poor farmers and consumers? And what research and information are needed to develop frameworks and policies on these issues and other important ones?

The primary motivation for the 2003 Regional Policy Dialogue on Biotechnology, Agriculture, and Food Security in Southern Africa was the food crisis facing the region. Historically weak policies to encourage and enable increased agricultural production among smallholders, coupled with environmental shocks, had brought a severe shortage in food crops and left millions of people at risk of starvation. The crisis, which was only slightly alleviated owing to the inadequate responses on the part of the governments in the region, underscored for many in the development community the need for wider agricultural biotechnology adoption and dissemination 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 biosafety system to scientifically evaluate the risks of GM products for their respective national contexts.

Yet today the region as a whole is not far along the road of biotechnology development and assessment. Modern biotechnological techniques are being employed in only a few southern African countries, namely, 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 (GE) 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 food crisis in the region fundamentally and irreversibly altered the content and nature of the debate on how to respond to such crises. But biotechnology has also 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 signaled the likelihood of the production of GM crops in the region not far in the future. Generally, while some welcome this prospect, others see this potential development as adverse. Both groups, however, are concerned about the numerous uncertainties regarding the relevance, efficacy, sustainability, and safety of the technologies.

This chapter seeks to draw from the preceding chapters some of their lessons and recommendations for the future for consideration by stakeholders in southern Africa and the wider agricultural development community that needs to support them. To properly address the uncertainties that biotechnology raises, generate information, and ensure that the technology serves the needs of the poor in southern Africa in an environmentally sustainable way, the multistakeholder dialogue begun in earnest at the Regional Dialogue held in Johannesburg—a dialogue at the national and regional levels involving public- and private-sector bodies and non-governmental organizations (NGOs) concerned about the issues the technology raises—will have to be expanded and sustained. Through involving groups from civil society this dialogue might attain characteristics of being a societywide process. The conflicts over biotechnology both at the global level and in southern Africa are deep, and without a consensus-building process it is unlikely that biotechnology will move in any direction. The decisions each country and the region as a whole will ultimately make on the issues is another question. But what are urgently required in the debate at this point are greater awareness, information, and understanding, which research can further, as well as more clarity on the measures that can be adopted on the more practical issues, many of which need to be implemented immediately. These include measures related to biosafety, trade-related issues, and biotechnology adoption in the region's agriculture. How to develop capacity for biotechnology governance will be another question the dialogue will be able to inform.

An ongoing regional dialogue will certainly face challenges, because the uncertainties and controversies surrounding the role of biotechnology in agricultural development and food security enhancement are not peculiar to southern Africa, but rather reflect those of the entire global community, and because the need to resolve urgent matters, such as those surrounding biosafety, may work against the process of reaching consensus. However, if the dialogue can serve as a framework for more effectively addressing these matters, and in turn be enriched by the information generated from actions taken, it can sustain the interest and commitment of the stakeholders and more likely direct biotechnology toward reducing hunger and poverty in the region.

### **Expanding and Sustaining Multistakeholder Processes in the Region**

Why are multistakeholder dialogues on biotechnology so important? As a number of the chapters in this book have illustrated, while on the surface the clashes over 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 are fundamentally about differences between disciplinary perspectives, ethical worldviews, and paradigms. Moving toward consensus on the issues will require exploring and finding some common ground between these deeper and more powerful notions, which in large part form the identities of those who hold them.

Differences among informed stakeholders stem to a degree from contrasting disciplinary approaches and methodologies for knowledge generation. Whereas in the biophysical sciences a tight, narrow, and experiment-based hypothesis-testing approach is employed, the social sciences are interested in looser and broader hypotheses on collective behavior for which neither theory nor data provide clear answers on causal relationships. At a more profound level, the reductionism that drives model building and hypothesis testing in the sciences, including the work of some social scientists, is opposed by the more humanities-oriented approaches to social study, in which explanation tends to be built on narrative and ideological perspectives often explicitly inform analysis. In some cases, as in that of environmental advocacy groups, political perspectives and scientific hypothesis-testing approaches merge.

Among these stakeholders and those whom agricultural biotechnology will more directly affect, various competing moral frameworks and cosmologies provide what might be seen as differences in shade. In Chapter 3 Julian Kinderlerer and Mike Adcock point out that in the minds of many people the current food crisis requires that biotechnology be introduced immediately to alleviate the suffering of the hungry. The Nuffield Council on Bioethics argues that developed countries face a compelling moral imperative to make GM crops readily and economically available to developing countries (Nuffield Council 1999). Others might support the use of the technology, but argue that governments and the scientific community have a duty to ensure that it is made available in a responsible way. Still others, distrustful of the technology, believe it is society's obligation to introduce the technology only once the appropriate legislation and regulatory frameworks are in place and risk-benefit assessments have been carried out. For this group developing and using genetically modified organisms (GMOs) are equivalent to "playing God": unnatural acts that can lead to unforeseen negative consequences for humans and the environment and should not be engaged in. It is not only environmental advocacy groups that hold this view: many societies have a deep-rooted belief that tinkering with nature is unacceptable. This view is likely to be as strong in southern African societies as it is 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 involved in this ethical worldview, which seeks answers to questions such as these: Is this new technology likely to increase the gap between the rich and the poor, both within developing countries and between these countries and the developed ones? Will the technology serve those who really need it, the poor? If the technology does enable more efficient and greater food production, will it do so at the expense of those who farm traditionally? Is this acceptable? Should consumers in the developed world eat GM foods if unjust economic and social processes have produced them? The ethical questions are not just about playing God, but about who benefits, by how much, and at what costs. A particular, complex, and normative understanding of the world is at work as each stakeholder deals with the issue of agricultural biotechnology.

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. As David Pelletier shows in Chapter 4, 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’s findings are important and troubling, and have wide and major implications. However, after calmer consideration one might say they are not entirely surprising. Faith in pronouncements claimed to be scientific has declined not only among the formally educated, but among the informally educated as well. Academia is more aware, and even inescapably aware, that ideologies underlie even the most “objective” scholarship, while in the real world people have experienced disillusionment with their leaders that has made them question the truth of official statements. Given the uncertainties involved in biotechnology, the fears to which they give rise, and the principles and rights that are at stake, it is understandable why the conflicts over it have been so great.

When a deeper appreciation of the controversy has been achieved, it becomes imperative that these underlying values, ideologies, and paradigms be addressed if some consensus on the use of biotechnology is to be reached. Furthermore, the intensity of the debate suggests that the key ethical and moral issues ought to be resolved to some extent before agricultural biotechnology is implemented. A multi-stakeholder dialogue therefore needs to include these issues in its agenda in order to bring some resolution to them and to find and maintain a dynamic balance between ethical and technical priorities. There has in fact been a growing recognition of the need, when dealing with scientific questions, to incorporate into the deliberative process broader considerations based on normative concepts. Insights from

both the positivist and the normative traditions are becoming increasingly integrated as agencies, stakeholders, and communities seek to develop more productive and appropriate methods for managing the risks and benefits of new technologies.

In Chapter 2 David Matz and Michele Ferenz outline the key conceptual issues in multistakeholder processes and offer various examples of the forms such processes can take. The case studies and the discussion they provide help build an understanding of the kinds of conceptual and practical questions that must be answered to facilitate an effective process. Unfortunately, as Matz and Ferenz state, the various attempts to build consensus on biotechnology in developing countries have not been explicitly conceived or implemented as multistakeholder processes in that they have not been fully cognizant of the central 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.

From the contributions in this book it is clear that there are essentially four challenges that must be met by a multistakeholder dialogue in southern Africa or by any such process:

- 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
- Establishing fairness and efficiency as criteria for evaluation of multistakeholder processes

It is clear to those who deal closely with issues related to biotechnology in southern Africa that the debate there is still confined to a very small and select group of stakeholders. In order to ensure a more 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 brought into them. The negotiation process must be accessible to all interested groups and also transparent. Yet while organizations in civil society can provide creative thinking and generate innovative policy options, it will be necessary to verify that they have the

requisite capacity to participate actively in the deliberations. The uneven participation of stakeholders is a common problem in such dialogues, and capacity constraints are one of the major obstacles to effective participation. This is a particular problem when stakeholders with vastly different levels of resource endowment come to the table together. The voices and recommendations of members of community-based organizations and NGOs ought to be taken seriously, but for this to be possible they must be well prepared, well organized, and able to remain in the dialogue over a long period of time.

Providing more information for all the participants is also crucial, as is discussed further later. The information must be in a form that all the parties can comprehend. The outcomes of a multistakeholder dialogue are typically not legally binding unless taken up by the relevant governmental authorities. Such a process in southern Africa will complement, not supplant, the established decisionmaking channels. But in order for the dialogue to translate the greater understanding of the issues it achieves into improved policies it will be critical for it to engage and assist those responsible for making decisions on the issues. Finally, monitoring and evaluating technologies and the regulations designed for them will have to be an essential part of any dialogue. However, it will also be vital to monitor and evaluate the dialogue itself, through engaging the participants, in terms of whether it is giving each stakeholder an equal voice, does not have a vested interest behind it, and is actually producing results.

In fact, the aim of a dialogue in the region should not be so much to develop consensus. Rather it should be to agree on the nature of the process that the countries and the region as a whole need to adopt to move toward consensus. What types of processes can be employed? Stakeholders could reflect on the types of dialogues that have been used effectively in other settings and those on biotechnology that are emerging in the region. Developing consensus on the issues will not be an easy task. If the focus is on ensuring a good process instead, positive 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
- Consider constructive linkages between the policy dialogue and other dialogues addressing the long-term food security of the region

Paying more attention to the process and to building relationships than to outcomes and dialogue structure is also important because no single and unified approach exists that can be adopted for any context. Multistakeholder dialogues are nonlinear and iterative in nature. A dialogue does not start at point *A* and end at point *Z*, with the same agenda throughout. It is full of uncertainty, and its outcome is not predetermined but rather changes depending upon the interests of the stakeholders. 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. The potential is present for governments in the Southern African Development Community (SADC) region and their development partners to expand and lengthen existing dialogues at the national and the regional levels and to initiate new ones. The experiences of these processes will teach us what they have achieved and how they can be made more effective.

### **Sharing Information and Building Awareness**

The decisions of participants in multistakeholder dialogues and policymakers on the use and safety of agricultural biotechnology must be based on credible scientific information that all the stakeholders accept as valid. A key problem in the debate over biotechnology is the existence of false information and misrepresentations. In the absence of accurate information and the dialogues that help stakeholders to achieve consensus on it, conflicting claims arise that only make decisionmaking more difficult. More information on biotechnology, both for the dialogue members and for society as a whole, would build greater awareness and understanding of the issues and facilitate agreement on the issues and sound policymaking. Two



general types of information would benefit the different stakeholders in southern Africa and the dialogues in which they engage: information on the technology itself and information on how the dialogue could increase awareness and participation and improve information sharing among its members.

Among other things, focusing on the process means engaging in a collective effort to obtain the information necessary to develop good policies and regulations. A dialogue at the national or the regional level in southern Africa should be informed on an ongoing basis by as much relevant information as possible on 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. Supplied with the available knowledge on the issues, eventually the dialogue process itself will generate information by monitoring research activities or policies implemented.

The governments in the SADC region will also need to support awareness building on biotechnology across the general population, because their people have a right to know how the technology might affect their lives, but misconceptions about it exist at all social levels. An informed society will influence national policy-making and research on the issue for the better. To disseminate information, civil society groups in the SADC countries and networks among them may be used. 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 bring benefits to the dialogue process, as it will help strengthen the capacity and knowledge base of farmers and consumers for participation in the process.

Awareness building can in fact be more successful if knowledge is gathered on the effective approaches that have been used to generate and share information. The dialogue could begin by collecting and examining what countries in the region

and outside it are doing in terms of public awareness activities on biotechnology and then developing best practices and deciding how participation can be improved. It would also be possible for those involved in individual dialogue processes to form links with one another to share information on communication strategies and how national and regional networks and civil society and research organizations have disseminated their findings. What is particularly lacking is information on processes of policy formulation on biotechnology and the role of the different stakeholders in these processes. The 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. Some 52 meetings on biotechnology were held in Africa in 2002, and a lot of information is already being gathered. Those participating in the dialogue could benefit from and add value by analyzing these processes and drawing lessons for themselves and others.

### **Investing in Research**

The most critical information southern African stakeholders and policymakers need 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. A stakeholder dialogue can guide the research process and form a more effective link between the dialogue and policymaking. Because of their increased awareness of the potential dangers and benefits of the technology, policymakers are in a better position to see the need to develop necessary regulatory frameworks. All stakeholders, too, have different questions that they want 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.

As David Pelletier points out, 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. Yet unfortunately research of this type has often been neglected in the case of agricultural biotechnology. In part this reflects the lower 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 relationships between GM crops and soils or the impacts of climatic conditions on ecological safety, which environmental scientists say is very important. And more information is needed about the whole range of food safety concerns related to GMOs under the conditions experienced by African populations, such as vulnerable health status and diets with very large shares of single commodities. Some of the main purposes of participating in the dialogue should be to guide, learn from, and provide feedback to research organizations in the region and internationally.

However, a dilemma the dialogue participants will face is that while the process is gradually moving forward there will be measures that they will have to adopt, or issues they will need to address rather urgently. These are issues regarding biosafety and trade issues that relate to GM crops and foods. Yet 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. If these issues are addressed within a dialogue, the resulting efforts and policies could be more successful.

#### **Promoting Biosafety**

One critical problem that was exposed in the debate over GM food aid is that 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, namely Malawi, South Africa, and Zimbabwe, have legal mechanisms for biosafety. The rest are still at varying stages in the development of their biosafety systems. Most of the countries did not prioritize development of biosafety regulatory structures because of the low level of biotechnology research and development in their countries. If lessons from the 2002 regional food crisis are anything to go by, the countries in the region are best advised to put their regulatory and scientific monitoring mechanisms in place, because GM products may enter the region not from research efforts going on there, but instead 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 created, as they will provide an enabling environment and monitoring mechanisms for biotechnology research and development and the use of GE products. A particular challenge to each country will be harmonizing regulations among their different public agencies, with other countries in the region, and with international

agreements. Success in designing and implementing effective biosafety policy frameworks at the national and the regional levels will depend on national and regional commitment and cooperation, which a dialogue process can facilitate, as well as attention to the different country contexts and to capacity building.

In Chapter 1 Doreen Mnyulwa and Julius Mugwagwa inform us that opportunities exist for the SADC countries to collaborate, share information, and create synergies through dialogues. Given that three of the SADC countries already have biosafety systems, the experiences of these nations can be shared to allow for 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 a dialogue should be as follows:

- To debate and come up with solutions as to how to harmonize regional policy on biosafety
- To link biotechnology and biosafety with trade policy
- To examine the missing links between national and regional policy approaches and determine which issues can be best addressed regionally versus nationally

In creating biosafety frameworks the stakeholders of the region will need to give attention to their respective economic, social, and cultural contexts. They would benefit from critically examining 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. However, these approaches are likely not entirely appropriate for the SADC countries. Whereas in the European Union modern biotechnology spurred the development of new regulations, in the United States scientists and regulators decided not to introduce new laws for biotechnology products but to rely on the country's existing regulatory structure. It is important that the southern African countries become very knowledgeable about the U.S. Food and Drug Administration's policies and their scientific, legal, and political bases so that they can engage in discussions and negotiations on biotechnology on a more equal footing.

The importance of developing biosafety frameworks that are attuned to the cultural food habits and economic and health conditions of southern Africa is illustrated by the U.S. experience. By not taking these considerations into account in making food safety determinations, U.S. agencies created a danger of announcing that GM crops are safe when they are not necessarily so for all populations. The

population of southern Africa consumes unique foods, uses unique 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 needs to be considered when testing GM products in the region. Contextual factors such as these will require greater attention in the future as GM foods with more complex changes come under development. An examination of how the scientific, legal, and political matters related to the new technology were addressed in the U.S. context holds lessons for southern African countries as they ponder the most appropriate institutional and procedural mechanisms for them to use to reach judgments, identify policy choices and trade-offs relevant to their region, and develop policies of their own. There is a clear need to balance benefits to human health and the environment with risks. People in the region need to feel safe and assured that their safety, health, and beliefs have been taken into account as far as possible before new forms of food products are introduced.

Key aspects of a biosafety framework should include the following:

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

Governments can use a number of specific measures to reduce the potential food safety risks of GM foods:

- Mandatory (rather than voluntary) premarket testing of new products
- Greater standardization of testing methods and decisionmaking criteria
- The use of newly emerging broad-spectrum profiling techniques to detect unintended compositional changes

- Consideration of the diverse contexts in which a given GM product may be consumed when developing, testing, labeling, and exporting or importing GM foods

In Chapter 5 Unesu Ushewokunze-Obatolu offers the following among several general recommendations for the creation of biosafety policies:

- Strategic action plans should be developed to realize the objectives set out to address selected policies.
- Member countries should be urged to design policies and actions that can be extended into regional and international arrangements.
- Member countries and the SADC should review their resource base to ensure that they can make effective commitments to allow biosafety processes to begin taking effect sustainably.
- Member countries and SADC should 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.
- Regional efforts to enhance biosafety research and testing should be promoted to reliably inform regulatory authorities and other regional decisionmaking structures in order to facilitate movements and trade involving GMOs.
- Investments should be made in systems for the retrieval and exchange of relevant information in order to establish national and regional biosafety information nodes for storage.
- The legislation and regulatory mechanisms adopted should be sufficiently flexible to account for the dynamism of biotechnology and biosafety and for their rapid development.

To develop biosafety regulatory frameworks, the countries in the region will require the necessary capacity in a number of areas. As a preliminary step, the governments and stakeholders can identify the capacity gaps. Improved skills and knowledge will be needed in the areas of scientific research, regulation, legal services, and policy. Based on the gaps, the actors can take decisions regarding the

areas in which investments to close the gaps are needed immediately and the areas in which biosafety functions can be phased in once the capacity necessary for them exists. Capacity-strengthening strategies for biosafety will have to be prioritized and must be realistic. The countries of the region could conduct assessments and develop capabilities individually. However, they could also do so through regional cooperation, and given the differences among the countries in terms of biosafety development, there could be regional actions to coordinate cross-border capacity building. The SADC is well poised to provide leadership in this area and in others concerning biosafety development. Regional coordination of efforts for creating effective regulatory systems, including their harmonization, will also improve regional economic activity and food security.

#### **Facilitating Trade**

Divorcing biosafety from trade matters is difficult, because GM products constitute an increasing portion of exported and imported goods in the global economy. Indeed, in order to continue participating in world trade all southern African countries will have to develop biosafety policies that enable them to evaluate GM products entering the country for environmental and food safety. Trade in GM crops and food, which may play a significant role in food security, makes the formulation of biosafety regulations urgent.

Increased agricultural and food trade among the SADC countries is likely to bring benefits to all of them in the form of growth and food security. For this reason, harmonizing the biosafety regulations of the different countries would make sense. Given the similarities among many of the countries in terms of economy, ecology, and food habits, it would also not be difficult. However, the World Trade Organization (WTO) is putting pressure on countries to harmonize their policies with its regulations. Although making their policies compatible with regional and WTO standards would facilitate trade for these countries, each country should be able to establish regulations that meet its needs and goals.

Biosafety guidelines are vital for the southern African countries to enable them to decide whether they should receive GM products as imports or food aid. But they will be absolutely necessary if these countries wish to be among those in the world that are developing and exporting genetically engineered agricultural goods. In fact, fears have arisen that because the traditional exporting nations have adopted biotechnology, they will increase their exportable surplus, depress world prices, and make nonadopting importing producers, such as countries in Africa, less competitive. This would add to the problem for southern Africa's countries, particularly the poorer ones, of protected markets and subsidized farmers in developed countries. Yet the introduction of biotechnology provides an opportunity for developing

countries to produce higher yields, lower their production costs, and source cheap agricultural exports. At the same time, the SADC countries may enjoy these benefits 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. Preliminary questions countries of the region will have to ask are these: Which are the major traded commodities for which there are GM variants? Are these crops potential export crops for southern African countries? And how might the production of these crops affect exports to market of long-standing importance to the region?

Different consumer preferences in the world regarding GM foods—and, as discussed earlier, the environmental, food-habit, social, and health conditions 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. Moreover, 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. However, food safety is also a vital issue, and presently the regulations on GM foods in the WTO treaty 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. Harmonized legislation would facilitate the smooth movement and transit of GM material within the region, whether for commercial or noncommercial purposes. Clarifying national guidelines among the different ministries involved is a step that must actually be taken first. The SADC countries should harmonize their policies and procedures for standard setting and enforcement, risk assessment and management, prior informed consent, and information and documentation. At a minimum, the rationalized and harmonized policies should facilitate the approval and movement of products in the region.

The production of GM crops certainly has the potential to bring economic benefits to small farmers and food security to the SADC countries. But as Moono Mupotola reminds us in Chapter 7, it is not a panacea that will resolve the trade-related difficulties the region faces. If the area fails to address the export subsidies



and protected markets in developed countries and their adverse effects on developing countries, little benefit will result. It is within the SADC's interests 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 alone.

### **Strengthening Capacity in Research, Policy Design, and Policy Implementation**

For policymakers in southern Africa to possess the will to address biotechnology issues is the most important step. Following this they will need, in cooperation with the other stakeholders, to develop the requisite capacity in their countries in the areas of scientific research, policy design, and policy implementation, which will enable them to develop sound strategies for agriculture and for consumer and environmental safety.

Capacity is needed in several areas to develop and implement consistent biotechnology and biosafety strategies, policies, and regulatory systems. Core scientific capabilities and infrastructure are required for research on GM crops and, regarding biosafety, on biotechnology product evaluation, risk management, inspection, and monitoring. Equally important are competencies in managing the institutional processes that support these activities. Policy analysis and development capacity for biosafety, including trade issues, deserves attention, as these issues are relatively new and policy managers may not have the necessary backgrounds in them. Legal abilities in particular are lacking due to a shortage of legal professionals with an understanding of biotechnology. Biotechnology and biosafety know-how may be lacking in the officials in charge of regulations. The SADC lacks institutional capacity at both the national and the regional levels. One of the outcomes of this has been the region's failure to adopt appropriate time-bound performance indicators for its protocol ratification processes and programs.

Capacity strengthening for all the different areas and for the whole region will take time. The southern African governments should therefore ensure the provision of long-term funding for this goal. They will also need to prioritize the areas for capacity building based on their broader policies on biotechnology, biosafety, and trade and must have at least a degree of capacity for risk assessment and risk management.

Given the varying levels of capacity and resource endowment in individual SADC countries, structures and mechanisms for collaboration and the development of synergistic relationships should be developed to facilitate the pooling of resources

across countries. The dialogue process can assist in the identification of capacity gaps and in the sharing of knowledge on experiences. Harmonization of policies across the region will also make regional efforts toward capacity development more manageable. 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. This would place the region on an even footing with the developed world in discussions and negotiations on biotechnology issues.

### **Developing a Broader Food Security and Poverty Alleviation Strategy**

Adopting biotechnology for agricultural development, if done responsibly, can bring significant gains to the countries of southern Africa. But the specific role this technology will play in development and where the region will acquire the elements of this technology are issues that the governments of the region will need to clarify. The production of GM crops will be only one element of a broad set of strategies to achieve food security, poverty alleviation, and development, and the governments, other national stakeholders, and bodies at the regional level will have to consider a number of issues in deciding what part it will play in the region's broader biotechnology strategy and what other elements should be included, based on the benefits they expect to realize from this technology.

Should one of the countries that is presently not growing GM crops decide to do so, it will have to decide whether its own research institutions will develop the technologies or whether it will procure them from outside firms. If the technologies of multinational research companies are obtained, greater clarity in the policies of the southern African countries on intellectual property rights (IPRs) will be required. Although southern African countries have acceded to one or more regional or international agreements on IPRs, there is a lack of clear-cut policies on them in most of the countries in the region. Strong IPRs can provide the incentive private companies require to sell their technologies. As a result of the technologies, advocates of protective IPRs argue, a country can make advances in agricultural growth and food security. Although few African countries have the resources to develop their own large biotechnology programs, they could still benefit from the technologies of foreign firms.

Yet as Norah Olembo states in Chapter 6, in the southern African region there appears to be a lack of appreciation of the role of IPRs in development. Governments in the region therefore ought to clearly define the level of protection they want to provide for biotechnology innovations and consider conforming to the provisions of the Trade Related Aspects of Intellectual Property Rights agreement should they decide to procure technologies. For their own benefit, they will also need to decide on the desired extent and use of IPRs and determine the cost implications. There is a growing need for partnerships and collaboration among southern African institutions and multinationals in the area of technology transfer, which could enable research on crops important to the poor. But even these arrangements will require clarity on IPRs.

An alternative exists that allows countries in the region to 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. The document was developed as a model for African countries to use to develop their own national laws. To date, though, no such laws have been enacted. IPRs should be coherent and should balance the rights of the innovators with those of the poor. They should also reflect the needs of the country and its development goals. Regardless of whether the governments of the region decide to develop technologies themselves or lease them from outside, the protection to be granted to breeders and to small farmers and resources in the country need to be well articulated. A dialogue process can help to bring the different stakeholders and the private firms together to ensure that IPRs do not conflict with the public interest.

As the southern African countries ponder whether to adopt biotechnology for food security and poverty alleviation, they will have to answer a number of questions, some more specific, others broad and fundamental. One set of questions relates to the opportunities for biotechnology and areas that require intervention. The countries of the region will need to determine individually, given their economies, what needs biotechnology can meet and specifically what crops should be targeted or what traits developed. As discussed earlier, genetic engineering technologies and the systems to ensure their safety need substantial financial investment and capacity, and countries are best advised to invest in areas in which they have sustainable competitive advantages or in areas that address their priority food security needs.

A related question is this: should the approach to adoption be reactionary in the sense that a country or a subregion should merely procure innovations developed

elsewhere, or should the policy be a proactive one whereby the country or the sub-region can produce technologies specially designed to meet the needs of subsistence farmers, consumer health, or HIV/AIDS-burdened areas with certain micronutrient deficiencies? If both strategies are pursued, where should the balance lie?

Governments and other stakeholders should ask a number of fundamental questions about the place biotechnology should have in the southern African countries' development strategies. One of the most pressing questions in the ongoing debate in the region is this: what will the technology, and all the investments required for it, contribute to food security? As one of the participants in the regional dialogue said, cotton is not going to solve the food insecurity problem. Investments in biotechnology will need to be considered in the context of national agricultural development and food security plans.

Several aspects of the southern African context need to be taken 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 it is not clear to what extent and how they will do so, especially if the underlying causes of these problems are not simultaneously addressed. Another question southern African governments have to answer is this: what policies do we want to pursue given these uncertainties and conditions?

The response to this question will depend to a significant degree on the relative importance to policymakers of reducing household food insecurity and malnutrition, especially among vulnerable groups such as women and children, and reducing sickness. But both GM-inclusive and non-GM policy options are available for achieving each of these goals. What are the potential benefits, risks, and costs associated with the policy options in each group? Are the GM-related policies superior generally? 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.

A view that many critics of biotechnology have expressed is that it is a technological solution advanced to solve problems that at root have political and economic causes. Non-GM policies to eradicate hunger and malnutrition have been implemented and shown success when they were designed to suit local contexts, were well managed, and received the requisite levels of political, institutional, and economic support. So is there a need for GM adoption? Moreover, with the intro-

duction of biotechnology, these basic and necessary policies may be neglected. It is also being increasingly recognized that food security depends on the broader foundation of good governance, peace, rule of law, respect for human rights, and equity in development. Even if GM technologies are applied, it is likely that if they are to ultimately have a positive impact on malnutrition and food insecurity it will be necessary to continue and even expand the “conventional” programs that have been implemented to these ends and to improve governance. Some examples illustrate the need for programs for nutrition, health, employment and income generation, education, safety nets, legal rights, and other goods to accompany the adoption of biotechnology. For instance, iron and pro-vitamin A (beta carotene) in plants has 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 women have difficulty providing due to their own poor health, nutritional status, and knowledge, as well as time demands. Another question for the countries of southern Africa to ask is this: if there is weak commitment to provide the types of programs and the quality of governance on which GM adoption will depend to generate benefits, will it make sense to pursue the application of biotechnology for food security and poverty alleviation?

### **Creating Sustainable Financing Mechanisms**

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. While multilateral and bilateral donors are likely to be willing to support these actions to promote national and regional ownership and control of the biotechnology agenda, the nations of the regions must also be willing to commit their own resources. They can do so either individually or collectively via the SADC. Obtaining donor support and allocating resources effectively will hinge on clearly defining and gaining broad acceptance on the national and regional needs and priorities. The countries can take the important first step of identifying these needs and priorities under the aegis of the SADC. A collective effort could bring greater efficiency and more rapid outcomes.

The Food, Agriculture, and Natural Resources Policy Analysis Network–International Food Policy Research Institute initiative on agricultural biotechnology

is based on a vision of catalyzing an expanded and sustained regionwide dialogue among the national governments, regional bodies, organizations of farmers, the poor and consumers, those representing the environment, and the international agricultural research and donor community on the future of the technology and of biosafety in southern Africa. It is hoped that this multistakeholder process will also generate cooperative action on the part of the members to take the necessary steps for ensuring the safety of the region's population and environment and for responsibly pursuing biotechnology-led agricultural development. 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 as each decides which direction is best for its population.

To continue and develop the dialogue, those promoting the initiative envisage an integrated series of forums on biotechnology, agriculture, and food security in southern Africa that are carefully facilitated and highly participatory, involving a significant number of high-level policymakers, senior representatives of a range of stakeholder agencies, and respected scientists. Interlinked roundtable gatherings are planned to take place over several months. Bringing different views to the table for deliberation and information sharing has the best chance of building consensus, which could then lead to the collaborative planning, implementation, and evaluation of various activities.

But deepening the dialogue and involving more parties in it will not be without its challenges. It will experience bumps at times, strong conflicts among members, and possibly dissolution due to this conflict, a lack of interest, a 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 among the members, maintaining communication, exchanging knowledge, and being open to revisions of old views will not only help the dialogue last, but will also be more productive.

Naturally the parties in this dialogue will also have to possess an interest in and make a long-term commitment to moving forward. If they lack the resources or capacity to participate, it will be necessary for them to acquire these, which may be done through the dialogue as an institutional structure. Some who are skeptical about multistakeholder dialogue processes are present who believe such approaches are unnecessary for action to be taken on biotechnology. However, in light of the conflict that has existed on the issue and that is likely to grow more intense in the future if honest deliberation does not take place, the question is this: what will the outcomes be for the countries of the region if a dialogue is not established?

Initially it may seem that the multistakeholder process is taking time. The process may also seem to be too precautionary, that is, antiscientific, antitechnological,

and insensitive to the poor. But addressing biotechnology in this way will bring all the concerned parties on board and get them moving together in some direction on the numerous issues. A process of this kind will also adopt a broader view of the issues and of development, food security, and poverty alleviation, and will make sure that the knowledge provided members on the benefits and risks of the technology is reliable. By working carefully and collectively, the process will also be more open, transparent, inclusive and accountable, and sensitive to the normative dimensions of the issues so critical to the participants.

**Reference**

Nuffield Council. 1999. *Genetically modified crops: Ethical and social issues*. London.