# BIOTECHNOLOGY AND SUSTAINABLE DEVELOPMENT IN AFRICA
## Towards Regional Consensus and Common Strategy

### INTRODUCTION[1]

The role of modern biotechnology in the economic transformation and sustainable development of Africa is the subject of increasing debate and controversy. The debate can be traced to the late 1980s but has acquired new dimensions as a result of a variety of factors including rapid scientific and technological advances, increasing commercialization of genetically modified foods, increasing food insecurity in Africa, and growth in the activities and influence of environmental activists. Recent famines and hunger in parts of Sub-Saharan Africa and the decision by some African governments to reject genetically modified food provided to their countries as aid have moved the debate from the confines of scientific and environmental groups to the centre of public policy and politics in the region. There are two extreme positions that characterize the debate: pro- and anti-biotechnology camps.

The extreme pro-biotechnology groups catalogue potential benefits of the technology and often dismiss any concerns about potential risks. They tend to portray biotechnology as the panacea to food insecurity in Africa. On the other extreme are the anti-biotechnology activists that associate the technology with nothing but danger and risks. They would like the development, commercialization and application of the technology stopped. The two extreme views have tended to confuse many African policy-makers and sections of the public because of the lack of reliable information and guidance available to these groups. There is increasing uncertainty and confusion in many of the African governments' responses to a wide range of social, ethical, environmental, trade and economic issues associated with the development and application of modern biotechnology. This is likely to deny African countries opportunities to derive benefits while at the same time minimizing risks from the technology. These countries need to establish informed policies and strategies to respond to developments associated with biotechnology. They should not continue to react to agendas set by other regions of the world.

The Council of Ministers of Food, Agriculture and Natural Resources (FANR) of the Southern African Development Community (SADC) decided in July 2002 to establish a sub-regional advisory committee on biotechnology. The committee will provide advise to countries of the sub-region on issues associated with biotechnology and propose ways of harmonizing their policies and regulations. The work of this committee may enable SADC countries to develop and adopt a proactive strategy to respond to issues raised by biotechnology.

The New Partnership for Africa's Development (NEPAD) calls for the creation of an African platform on biotechnology. It articulates two interrelated goals of the platform.

[1] This paper was prepared by Dr. John Mugabe of NEPAD for the African Ministerial Conference on Science and Technology for Development.

This first is to "generate a critical mass of technological expertise in targeted areas that offer high growth potential" from biotechnology and the second is to "harness biotechnology in order to develop Africa's rich biodiversity and … improving agricultural productivity and developing pharmaceutical products."[2] To realize these goals African countries will need to first and foremost build common consensus and strategies on how best to ensure that they maximize benefits from the technology while at the same time addressing potential environmental, health, ethical and economic risks or concerns emerging with rapid advances of the technology.

NEPAD's first intergovernmental workshop on science and technology held in Johannesburg 17-19, February 2003 recognized the urgency of African countries developing and adopting a common position and strategic approach on biotechnology issues. It was recognized that the absence of African consensus and strategic approaches to address emerging biotechnology issues allows different interest groups to exploit uncertainty in policy-making, regardless of what may be the objective situation for Africa. Representatives of African governments attending the workshop recommended that NEPAD should establish a regional platform on which Africa countries can engage in dialogue and develop a common biotechnology strategy. The platform would be a structured regional forum of processes of dialogue, consensus formation and the development and adoption of common policies and strategies on biotechnology. The organization and management of activities of the platform will require high-level technical and administrative oversight.

This is a proposal to establish a high-level African Panel on Biotechnology (APB) under the auspices of NEPAD. The APB would facilitate open and informed regional multi-stakeholder dialogues on, inter alia, scientific, technical, economic, health, social, ethical, environmental, trade and intellectual property protection issues associated with or raised by rapid developments in modern biotechnology. It would provide a structured context or frame of reference for a region wide debate and dialogues on issues associated with the development, commercialization and application of modern biotechnology.

The APB would use succinct analyses to propose and promote the adoption of a regional strategy on biotechnology. Such a strategy should reflect Africa's common values, articulate shared needs and should focus on common opportunities. It would aim at identifying specific common areas of technology development, risk assessment, capacity building, and appropriate institutional arrangements to enable African countries, through NEPAD, to effectively respond to developments in/with modern biotechnology. The African strategy on biotechnology would be presented to and adopted at a high level Africa inter-ministerial symposium on biotechnology and subsequently by NEPAD Heads of State and Governments Implementation Committee (HSGIC).

## 1. BACKGROUND

[2] NEPAD, 2001. *The New Partnership for Africa's Development*, p. 36.

## 1.1 Overview of the Debate and Issues on Modern Biotechnology

In both developed and developing countries, the introduction and commercialization of products, particularly crops and foods, derived through the application of modern biotechnology have sparked an intense public debate. Broadly speaking, the issues at the centre of this debate and growing controversy include: ethical and social considerations in product development and commercialization; the adequacy of regulatory measures and related administrative oversight for the assessment of potential environmental, economic and health risks; approaches to dealing with uncertainty in both the short and long terms—essentially interpretation and application of the precautionary principle; consumer liberties and choice; effects on trading relationships; and intellectual property protection and distribution of benefits to developing countries.

There are sharp differences of opinion about the environmental and health impacts of genetically modified (GM) crops and foods. Proponents of modern biotechnology argue that crops genetically modified to resist pests and diseases and requiring less use of pesticides and herbicides are safer for the natural environment than conventional crops and are less likely to result in pesticide-related illness. Opponents focus on the potential detrimental impacts of GM crops. They argue that GM plants producing their own pesticides could accelerate the development of pesticide-resistant insect populations, that out-crossing between herbicide-tolerant crop plants and closely related weeds could lead to "super-weeds", that engineered traits leak into adjacent non-GM crops, and that animal and insect species consuming transgenic plants could be harmed. Proponents would counter these arguments by saying that all of these risks exist with conventional agricultural products.

The development and commercialization of GM products have also raised complex social and ethical concerns. These range from fundamental opposition to the artificial manipulation of plants and animals to the argument that global justice is not being served by current applications of biotechnology. In particular, there are concerns that current applications largely target the needs of developed countries' farmers and consumers. The concerns are that applications are devoted to herbicide tolerance in soybean, cotton and maize, and do not focus on such traits as drought and virus resistance, and crops such as pulses, vegetables and fodder. There are also concerns regarding whether consumers' rights are protected. These are mainly about the need to provide individuals with reliable and adequate information to allow them to make informed choices about which products to purchase and/or consume.

Another set of issues that are at the center of the debate relate to the relationship between legal protection of intellectual property rights and transfer of biotechnology to developing countries. Many developed countries favour strengthening intellectual property protection through such agreements as the Trade Related Aspects of Intellectual Property Rights (TRIPS) agreement of the World Trade Organization (WTO). Their policy is based on the view that strong intellectual property protection will stimulate technological innovation and promote economic growth. Critics argue that strong

intellectual property rights protection will stand in the way of technological innovation and deny developing countries economic growth.

For many African countries the relationship between technological development and legal protection of intellectual property rights remains unclear. Most policy-makers and the general public do not have information and an understanding of how such legal protection will impinge on the development and commercialization of biotechnology as well as distribution of its benefits. This situation makes it difficult for them to participate in international debate on handling and transfer of biotechnology. They not able to engage private industry in informed dialogue on ways and means of ensuring that biotechnology generates benefits to the poor. On the whole, the complex of issues of intellectual property protection and their implications for biotechnology development in Africa are complex and high on the agenda on the public debate.

The debate is causing increasing uncertainty and tensions in foreign and trade policy. Witness the transatlantic 'GM trade tensions'—the USA viz Europe. While the USA has a promotional biotechnology policy, the European Union has adopted a relatively restrictive one. In Europe there is growing public hostility to GMO products.

> [G]enetically modified foods challenge traditional European ideas about food. Europeans simply regard biotechnology with suspicion, at least where their food is concerned. …All the talk of Frankenfoods in the United Kingdom has left its mark. Because of the public's response, the European approval procedures for GMOs are stringent and thorough. …European resistance to the introduction of GMOs is so strong that approval has practically come to a stop. Europe is faced with a crisis—voters do not want GMOs and do not believe in assurances of their safety. As a result, Europe is in danger of rejecting this new science of biotechnology despite its enormous potential for good.[3]

It has been argued that restrictive regulatory regimes of European countries will undermine the growth of their knowledge base, decline of their agricultural growth and trade, but may provide developing countries with more opportunity for knowledge accumulation and expanded agricultural trade.[4] Oehmke and co-authors argue: "developing countries have an opportunity to increase agricultural productivity and agriculture's contribution to economic growth by acquiring (importing) agricultural biotechnologies from the North. However, this requires developing and adopting appropriate biosafety and food safety regulations, and intellectual property protection (IPP), each of which is increasingly governed by international law."[5]

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[3] Richardson, J. 2000. 'EU Agricultural Policies and Implications for Agrobiotechnology', p. 81 in *AgBioForum*, Volume 3, Number 2&3, 2000.

[4] Oehmke, J., Maredia, M. and Weatherspoon, D. 2001. 'The Effects of Biotechnology Policy on Trade and Growth'. *The Estey Centre Journal of International Law and Trade Policy*, Volume 2 Number 2, 2002.

[5] Oehmke, J., Maredia, M. and Weatherspoon, D. 2001. 'The Effects of Biotechnology Policy on Trade and Growth'. *The Estey Centre Journal of International Law and Trade Policy*, Volume 2 Number 2, 2002/p. 289.

The divergent views and policies on biotechnology between Europe and the USA have created confusion and complicated policy choices for African countries. Most African countries are not sure of whether to "follow the more permissive U.S. approach toward GM crop technologies, or the more precautionary EU approach?...[they] are under pressure to adopt either set of policies or the other. These conflicting pressures are brought to bear consciously through bilateral donor agencies, international organizations, private business firms, philanthropic foundations, and international NGOs. Industrial world pressures are imposed … unconsciously through private international community markets, which alter crop prices in poor countries based on changing consumer tastes toward GM foods in rich countries."[6]

The debate is dominated by strong Western perceptions "about the risks and benefits of this technology and how developing countries should solve their agricultural problems. Very often, stakeholders in public debates in Western countries simply select NGO leaders or academic professors from developing countries who fit their view or interests and invite them to speak for the developing countries as a whole. But, apart from the fact that these experts cannot represent the view of their own country, … There is not just a single developing country perspective but several, each reflecting the particular social, political, economic and cultural circumstances."[7]

The participation of African countries in the debate and their decisions regarding the development and application of modern biotechnology should be influenced and informed by their own aspirations, needs and perceptions of this technology. It should evolve as these countries gain a better understanding of the technology, and as their R&D efforts generate new products and processes, and as they assess and manage risks. The fact that there are divergent views on such complex issues is not surprising. Nor should it be a reason for failure by African countries to make informed decisions and to take action that is in the public interest—namely, to ensure that they reap the benefits of biotechnology while addressing any risks. First of all African governments should recognize that there are no simple solutions.

Secondly they should begin to encourage dialogue between and among all relevant stakeholders with the aim of clarifying the true nature of the issues and minimizing degrees of misunderstanding and confusion. Broader information disclosure and clear mechanisms for including public views in the decision-making process are essential confidence-building measures that should be encouraged as African countries begin to address the wide range of complex issues raised by modern biotechnology. Furthermore, multi-stakeholder policy dialogues will foster social and institutional transformations necessary to realize the full social and economic benefits of technological advances and to manage the challenges, pressures and uncertainties.

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[6] Paarlberg, R. 2001. *The Politics of Precaution: Genetically Modified Crops in Developing Countries*, p. 6. The International Food Policy Research Institute (IFPRI), Washington, D.C.

[7] Aerni, P. 2001. *Public Attitudes Towards Agricultural Biotechnology in Developing Countries: A Comparison between Mexico and the Philippines,* p. 10. Science, Technology and Innovation Discussion Paper No. 10. Cambridge, MA, USA: Centre for International Development (CID).

## 1.2 Towards African Consensus and Strategy on Biotechnology

Recent food insecurity and famine in Eastern and Southern Africa have brought to the African public and political arena the debate on the role of biotechnology in human development. This debate, which had been confined to small and often isolated groups of African scientists and environmental activists, is largely focused on whether products of modern biotechnology, in particular GM crops, will contribute to the solution of increasing food insecurity in the region.

More than 14 million people are faced with starvation as a result of sharp declines in food production caused by drought, flooding and a variety of other political, social, infrastructure and ecological factors in. Responding to the emergency food aid requirements, the USA provided several tones of GM corn or maize to Malawi, Zambia, Zimbabwe and several other countries of the region. In June 2002 the government of Zimbabwe rejected a consignment of 17,500 tonnes of maize from the USA because it was GM. The government was concerned that some of these grains would be planted and thus contaminate future harvest and potentially undermine the country's exports to the European Union and other countries that have banned GM foods. Later the government of Zimbabwe reversed the decision after a protracted controversy and intense diplomatic lobbying from pro-GM countries and groups. Zambia rejected and has maintained a ban on genetically modified maize from the USA citing potential human health risks. This is despite assurance from the US administration that the maize had been tested and proven to be safe for human consumption.

Zambia's decision on GM maize aid has elicited divergent views and stimulated controversy on the role of biotechnology in Africa's agriculture. The two extremes of pro- and anti-biotechnology groups have seized the opportunity offered by the divergence of Zambia and Zimbabwe's policies to promote their views and opinions about the technology's role in addressing food insecurity and famine in Africa. There are now many interest groups engaged in the debate on whether African countries should accept GM food aid. These range of groups of pro-biotechnology scientists to anti-technology activists. What is of concern is that they have focused no or very little attention on how African countries can best use science and existing regulatory instruments to make informed decisions. In some cases interest groups may be exploiting political uncertainty, food insecurity and economic instability to promote narrow agendas that deny the African public an opportunity to make its choices and may erode public confidence in existing regulatory regimes.

Another point is that the debate and emerging confusion in the region are intensifying as many African countries are starting to invest their scarce resources in biotechnology R&D. A review of R&D activities in the region shows that Algeria, Egypt, Ghana, Mauritius, Namibia, Kenya, Nigeria, Uganda, Zambia, Zimbabwe and other countries have projects and/or programmes dedicated to applying modern biotechnology to improve agricultural production. Egypt, Mauritius and South Africa have some GM crops on their markets while Uganda and Kenya have R&D and field testing of GM crops. A key question is how the growing debate and controversy will affect these investments and

influence trends in biotechnology R&D on the continent. If not well informed, the debate may cause more uncertainty in science policy and will irreversibly erode prospects of African countries conducting R&D to build their scientific understanding of the technology. It could also undermine current efforts to build appropriate biosafety frameworks (guidelines, laws and institutions).

Whether and how the debate is resolved and consensus built on the range of ethical, policy and legal issues pertaining to modern biotechnology will to no small measure determine Africa's participation in international trade in agricultural and pharmaceutical products. Its place in international trade and aspiration to establish a cohesive and integrated economic regime may be undermined if it does not address issues emerging with/from the GM debate. In particular there is need for African countries to address issues associated biosafety and intellectual property protection. Some of the key questions that they may wish to explore are:

- What common principles and policies should form part and parcel of national biosafety frameworks? Is there need to harmonize biosafety regulations and laws through common/African biosafety guidelines or protocol?

- What scientific and administrative capacities are required by Africa to effectively address issues associated with inter-regional and international trade in products derived from the application of biotechnology? Is there need for a regional network of centres of excellence in biosafety (risk assessment and management)? What organizational form would such a network take?

- How legal protection of intellectual property rights can be best designed to benefit low income groups (particularly rural farmers, traditional medicine enterprises, rural women and small-scale informal enterprises) in African countries within the context of international agreements, including the TRIPS agreement, the Convention on Biological Diversity and the International Union for the Protection of New Varieties of Plants (UPOV).

- What kinds of institutional arrangements will be required by African countries to negotiate for transfer of modern biotechnology (including its products) from private companies and industrialized countries' public R&D without violating intellectual property protection laws?

- Whether and how African should harmonize their intellectual property protection regimes to better or effectively respond to scientific and technological developments associated with biotechnology?

Biotechnology in general and GM developments in particular are not evolving in a socio-political vacuum. African public and politicians have a direct interest in scientific advances and technological developments associated with biotechnology, yet they are not participating in the debate. Considerable institutional space in the debate has been taken by isolated groups of organizations purporting to speak for the African rural poor. The

general public and farmers in particular are not informed about the nature of the technology, its potential benefits and risks, and rarely do they participate in deciding on what crops or problems biotechnology R&D should focus on.

With the intensifying debate, confusing counter claims from pro- and anti-GM activists, and often passive reactions by African governments, the public is likely to lose confidence in the scientific enterprise and overall decision-making authorities. What are required in the region today are processes that will legitimately bring the voices of the public to inform and change the focus and content of the current debate. Africa should establish a common broad-based platform to mobilize the public and scientific communities to build consensus and a regional strategy on biotechnology generally and related public policy issues. It is this challenge that NEPAD may wishe to address by establishing a regional biotechnology platform facilitated by a high-level panel of eminent experts.

## 2. OBJECTIVES

The overall goals of the proposed initiative would be to:

- Ensure that Africa adopts a proactive strategy to capture economic, health care, environmental, and industrial benefits from biotechnology and manage potential challenges, risks and tradeoffs associated with the development, commercialization and application of the technology;
- Support African countries to implement provisions of the Cartagena Protocol on Biosafety and related provisions of the Convention on Biological Diversity (in particular Article 19 on handling of biotechnology and distribution of its benefits);
- Strengthen Africa's capacity to respond to issues associated with modern biotechnology as they emerge in international negotiations at the World Trade Organization (WTO) and other international forums.
- Develop strategic ways and means of contributing to the fulfillment of NEPAD's core goals of sustainable development; and
- Facilitate the harmonization of biosafety regulations as well as build a regional network of centres of excellence in biotechnology management, including risk assessment and regulation.

The APB will be a body of eminent experts and opinion leaders established by NEPAD to provide comprehensive advice on current policy issues associated with the ethical, social, regulatory, economic, scientific, environmental and health aspects of biotechnology. It will:

(a) gather, analyze and provide information to all stakeholders to enable them to participate effectively in dialogues on biotechnology and its role in Africa's sustainable development;
(b) conduct technology assessments and foresights to map trends in regional and international biotechnology development and diffusion;

(c) organize and facilitate multi-stakeholder dialogues on topical issues emerging with the development, application and commercialization of modern biotechnology;
(d) build African public understanding of biotechnology and awareness of its implications—opportunities and challenges—for human development;
(e) build consensus on key issues and facilitate African countries to identify common priorities and approaches on how best to realize maximum benefits, especially in the areas of agricultural production, human health and environmental quality, and reduce any risks;
(f) promote sharing of national experiences in developing and implementing biotechnology policies and biosafety regulations;
(g) propose principles and guidelines to harmonize regulatory measures (biosafety frameworks);
(h) support national public policy development by providing governments with relevant factual information; and
(i) facilitate the formulation and adoption of an African strategy on biotechnology.

## 3. ACTIVITIES

### 3.1 Composition of the APB

The APB will be composed of a multidisciplinary team of leading scientists, representatives of civil society, industry, senior policy-makers and opinion shapers. In constituting the APB, NEPAD and partner convening institutions will ensure that panel members represent a broad spectrum of expertise and spheres of society and are drawn from such fields as genomics, economics, nutrition, philosophy, ethics, science policy, law, environment, business and theology. Experience in organizing and managing multi-stakeholder dialogues and policy development processes will be considered in constituting the proposed APB. It would be a small body (of not more than 15 persons) with flexibility and ability to draw on wider intellectual, political and administrative resources and expertise of existing competent institutions on the continent and abroad. Members of the APB will serve in their personal capacities and would not be advocates of particular views or opinions. A detailed body of guidelines for the operation or functioning of the panel will be developed by NEPAD and partner convening institutions.

To constitute the APB, NEPAD and partner institutions will:

(a) develop clear criteria for nomination of persons and circulate these widely through the website of its Science and Technology Forum (www.nepadst.org.za);
(b) invite regional economic and trade bodies (e.g. East African Community, SADC, the Economic Community of West African States, the Common Market of Eastern and Southern African States, the African Union), leading research institutions, industry, NGOs and other groups to nominate persons who would be considered for appointment to the panel.
(c) establish a small task force to vet the nominations and recommend to the NEPAD secretariat persons to be appointed to the panel,

(d) formally constitute the panel through appointment of members from the pool of nominations, and
(e) convene first meeting of the panel and lead in interpreting terms of reference and adoption of guidelines for operations.

The panel may wish to conduct its activities through two interacting working groups:: one on technology development, foresight and institutions, and another on risk assessment, regulation and management. The first working group would focus on issues of biotechnology R&D while the second on biosafety considerations. Being part of one panel, the two groups would hold joint consultations, exchange reports, commission joint studies where necessary and ensure that they generate one strategy and build common regional consensus. Having the panel operate through two groups would give it flexibility to give adequate attention to both R&D and biosafety issues. However, it will need to ensure that there is synergy in its operations as a whole and emphasis is developing a coherent regional strategy. The panel will consider this proposed organization of its operations at its first meeting.

### 3.2 Information Gathering and Analysis

The APB will require a rich body of literature and well prepared background papers. During its first meeting it will make decisions on the nature of literature and background papers that it will require. NEPAD will seek to commission component research institutions or persons to prepare the papers on the basis of terms of reference prepared by the panel. All the documentation required by or available to the APB will be posted on www.nepadst.org.za unless decided otherwise by the panel. This will include minutes of meetings of the panel and its subsidiary bodies.

Some of the key issues and/or areas on which detailed assessment and analysis may be required are:

(a) Global trends in biotechnology development, commercialization and application, including a comparative analysis of different institutional arrangements, policy approaches and emerging government and corporate strategies.

(b) Status of modern biotechnology R&D in Africa, emerging national policies and strategies as well as institutional arrangements for the R&D and commercialization, and experiences in GM product field testing and management.

© Public attitudes to and perceptions of modern biotechnology, in particular GM related activities and products, in Africa. Such a study will be guided by an appropriate conceptual framework and conducted using sound methodology approved by the panel.

(d) Comparative assessment/analysis of risk assessment and management regimes, in particular the kinds of biosafety frameworks (guidelines, policies and laws) being developed and applied by African countries, national experiences in formulating and applying the frameworks, the extent to which the frameworks are adequate instruments to domestic the Cartagena Protocol on Biosafety, etc.

(f) Intellectual property protection and implications for biotechnology in Africa, emphasis may be placed on the rationale for strengthening protection, emerging concerns from African countries, ways and means of ensuring that such protection does not

undermine Africa's capacity to effectively respond to developments associated with modern biotechnology; and

(g) Emerging ethical and social issues—in particular issues of morality, distribution of benefits, precaution as defined by different cultures, etc.

The APB may consider the above range of issues/themes and others and then commission international experts to prepare background papers that will guide its work. For each issue/theme detailed terms of reference will be developed and approved by the panel.

### 3.4 Fact Finding Missions

In addition to the above information gathering and analysis exercises, the APB will conduct fact-finding missions to selected public and private research laboratories in Africa, Europe and America to build a clear sense of the nature of biotechnology R&D activities, physical infrastructure and human resources, and risk assessment and management systems. The panel will also visit field tests and conduct interviews with farmers and consumers in those areas where testing of biotechnology products is being conducted. A detailed work-plan and guidelines for fact finding missions will be prepared by the panel.

### 3.5 Regional Multi-stakeholders' Dialogues

A large part of the panel's operations will be through open multi-stakeholder consultative sessions. The sessions will focus on key issues and will be conducted in an open manner though carefully structured and facilitated by the panel. The panel may also wish to engage special facilitators of the dialogue depending on the issues being addressed at each session. It will design and adopt specific guidelines on how the dialogues will be organized and conducted. It will initially experiment with various forms of organization drawing lessons from similar initiatives conducted in Canada, New Zealand and the United Kingdom. In these and other countries multi-stakeholder dialogues on biotechnology have been conducted. The panel may wish to invite a member of any of these countries' process to advise it on how best to organize and conduct the dialogues. But generally, the APB will consider holding dialogues through citizens' panels, interactive panels of scientists, consumers and environmentalists, consultative round tables on specific policy issues, etc.

The dialogues will be organized in the four sub-regions: Eastern and Central Africa, Western Africa (largely ECOWAS countries), Southern Africa and North Africa. Each sub-regional dialogue would take between 3-5 days structured in such a way as to enable as many stakeholders as possible to participate. The APB will use these to collate views and opinions on key issues associated with the development, commercialization and application of modern biotechnology. It would seek to promote a rational and balanced pluralistic dialogue between key players. A multidisciplinary approach will be promoted, in which a dialogue is established between natural scientists, philosophers, theologians, lawyers, social scientists, consumer groups, industry, etc.

The dialogues will offer Africa with a unique opportunity to pool ideas and exchange experiences relating to modern biotechnology, with a focus on whether and how the technology can be best harnessed to support the goals of increasing food security, improving human health and maintaining the integrity of the environment. Sessions will be designed to provide a real platform for debate among participants.

### 3.6 Electronic Forum

To build a broad-based inclusive platform and ensure that the views of many groups of stakeholders are received, the APB will establish an electronic forum that will be structured in such a way as to encourage open e-mail debates on specific issues. The debates will be guided by specific questions that will be posed by the panel and will be regulated in such way as to ensure that participants do not abuse the informality of e-mail communication. On each set of issues and from each session, the APB will prepare a synthesis of emerging considerations and note points where consensus may have been reached or not formed through the e-forum.

The APB will also consider using electronic means to organize and hold special discussions among key groups of actors. For example, e-discussions may be organized on each of the key issues to be identified by the panel. Such discussions will be restricted to international experts and/or opinion shapers and will be aimed at seeking technical advice or consensus among experts on technical and scientific matters.

The panel will develop an appropriate structure and guidelines for the e-forum and its various segments. It will draw lessons from similar efforts in Canada, New Zealand, UK and other countries/regions.

### 3.7 Public Media Sessions and Outreach

To reach out to as many Africans as possible and to build public awareness of modern biotechnology, the APB will seek to work with such special science media institutes as SciDev.Net. In particular, it will organize workshops or consultative sessions for African journalists and may develop its own packages of information e.g. press kits to be used by the media. It will seek to work with TV and radio stations on the continent to organize public briefing sessions. Specific strategies and guidelines on use of and engagement with public media will be formulated by the panel with support of specialized science journalism expertise.

### 3.8 Preparation of reports, policy and strategy document

Throughout its operations the APB will prepare and appropriately disseminate minutes, papers and reports of its proceedings, including reports of each dialogue, fact finding missions and consultative sessions. It will also post written submissions from various groups on its website.

The panel will prepare synthesis and analytical papers on key issues emerging from the whole process. These will be mainly policy oriented documents to inform decision-making on various aspects of biotechnology. These will be consolidated and used to prepare a regional strategy. The consolidated volume and strategy in draft forms will be subject to wide review at the inter-ministerial symposium proposed below.

### 3.9 Inter-Ministerial Symposium on Biotechnology

Given the multi-sectoral nature of modern biotechnology and cross-cutting issues it raises, the APB will organize an African Inter-Ministerial Symposium on Biotechnology. The symposium will bring together ministers from health, agriculture, trade, environment, science and technology, finance and education selected to reflect geographical and multi-disciplinary balances. The ministers guided by their relevant technical officials will receive, review and debate the synthesis report and draft strategy from the APB. Specific details of the organization of this ministerial segment will be developed further by the panel and its convening institutions.

Preceding the ministerial segment will be a series of workshops and consultations that will be organized by various groups, particularly research institutions to critically review the draft report and strategy. Their reviews will be consolidated and presented at the ministerial segment. The workshops and consultations will focus more on science and related policy questions and will not serve as platforms for expression of personal opinions or articulation of specific interest groups.

### 3.9 Publication and adoption of the African Biotechnology Strategy

The final report of the panel and the African Biotechnology Strategy generated through the range of activities described above will be published and submitted to the NEPAD HSGIC for consideration and adoption. The two documents will be distributed widely in Africa and abroad, with copies on various websites.