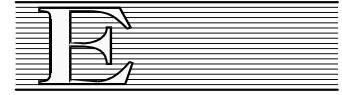




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## **Report to the CSD on the ECA Programme for Promoting Biotechnology in Africa**



## **Introduction**

1. Biotechnology, a contraction of ‘biological technology’, is a term used to represent a continuum of different bio-techniques, ranging from non-controversial tissue culture to controversial genetic engineering embodied in ‘modern biotechnology’. It has been identified as the leading technology of 21st century with tremendous potential to address economic, social and environmental issues afflicting the poor in developing countries. It is a tool of both great opportunities and many challenges. Its potential impact and benefits are enormous in agriculture development, health care, trade, environment and natural resources management, industry and energy development.

2. Many countries in America, Asia and Europe are already reaping the fruit of modern biotechnology. Africa also stands to do so particularly towards poverty reduction. Unfortunately, the continent utterly lags behind all its counterparts in the world insofar as mainstreaming this tool in the development plan and actually using it for sustainable development are concerned. Africa has yet to meet the basic requirements for the development, transfer and application of modern biotechnology. This situation will certainly erode its already poor ability to meet the NEPAD’s goal of at least 6 per cent annual growth in agriculture and the UN Millennium Development Goals of cutting hunger by half in 2015.

3. The present report elaborates on ECA’s efforts directed at helping Africa to overcome the constraints to the adoption and application of biotechnology for its sustainable development.

## **Objective and Plan of Work**

4. This report is produced as a background document for the fourth meeting of the Committee on Sustainable Development (CSD4), in conformity with the approved work programme of the Division of Sustainable Development (SDD) of the United Nations Economic Commission of Africa (ECA) for the biennium 2004-2005. Its main objective is a review of the ECA programme for the promotion of biotechnology in Africa so as to inform the CSD4 meeting of the Commission’s efforts in this regard and to generate, among African policy decision makers, the interest to address the challenges and take advantage of the great opportunities associated with the development, acquisition and application of the tool.

5. In addition to the introduction, the report successively covers the opportunities and challenges associated with the use of biotechnology, the status of biotechnology in Africa, the empowering justification for ECA’s actions for the promotion of biotechnology in the region, the constraint, the achievements, the way forward and the conclusion.

## **Opportunities and challenges associated with the application of biotechnology**

### Opportunities

6. Biotechnology provides a way forward in medicine and agriculture where earlier methods were less successful and “offers the only or the best tool of choice for marginal ecological zones left behind by green revolution but home for more than half of the world’s poorest people

depending on agriculture and livestock” (UNDP, 2001). In particular, it can be a strong arm against intractable biotic and abiotic stressors that cause havoc in agriculture and a hope for a victory over the devastating diseases such as malaria, HIV/AIDS and tuberculosis. Effective cleaning of pollutants in the environment in general and in the mining sector in particular is being performed more effectively than ever before through bioremediation. What is more, reafforestation and biodiversity conservation, and generation of modern biomass energy in lieu of traditional fuel can now add value to the livelihood security of the poor living on marginal lands.

### Challenges

7. Modern Biotechnology requires discipline and determination to succeed. Political will that goes beyond simple declarations and supports concrete and impact-driven actions is needed. Legal frameworks including safety and intellectual property legislations, which are overriding prerequisites for any biotechnology-related enterprise, must be in place. Regulatory agencies must be established and made effectively functional. Adequate human, institutional and other capacities must also be in place along with sufficient financial resources.

8. A demand-driven priority setting is required along with the capability to transfer to end-users and actually apply the process and product technologies generated. In developing countries, including African nations, these technologies must be pro-poor.

9. The ability to properly manage controversies and risks associated with the application of the technology is also a major requirement to be met. Information and communication policy and strategy are needed.

10. The controversies are many. They can be ethical, health-related, environmental, political or commercial. They are more pronounced in the food and agriculture sectors than in any other sector. Table 1 displays some of the potential benefits and threats/controversies associated with modern agricultural biotechnology. Other controversies in other sectors include concerns over human cloning, utilization of the tool for criminal activities, loss of biodiversity, transgenic processes that cross religious boundaries, and unknown long-term effects on human and animal health.

Table 1. Potential benefits and threats/controversies associated with modern biotechnology

<i>Potential benefits</i>	Potential threats/controversies
1. Higher crop yields	2. New allergens
3. Higher incomes	4. Antibiotic resistance
6. Less use of chemicals (pesticides, herbicides) With decrease expenditures on inputs	5. New viruses
	7. New weeds/super weeds invasion
	8. Gene flow
	9. Gene erosion
	10. Possible undesirable effects on non-targeted organisms
11. Less toxic herbicide runoff to surface water and groundwater	12. Use of terminator gene that prevents reproduction of seed and increasing input costs
13. Less exposure of farmers to chemicals leading to improved farmers' health	14. Monopoly on biotechnology research by a few powerful private firms
15. Control of abiotic factor	16. Lack of scientific and financial support for GM crop research from countries prohibiting such technology
17. Higher nutritional quality of foods	18. Trade ban on GM export products
19. Reduced pre- and post-harvest losses	20. Aggravation of the prosperity gap between North and South
21. Longer shelf life	22. Exploitation of natural genetic resources without appropriate compensation
23. Minimal exploitation of forests, grasslands, marginal lands, and swamplands for food crops	24. Unresolved issued relating to intellectual property rights and farmers' rights
25. Preservation of biodiversity	
26. Broader range of crops suited for marginal areas and consumed by poor people in tropical and semi-tropical areas (e.g., sorghum, cassava, pearl millet)	27. Gene piracy

**Source:** Adapted from ECA 2002 – **Harnessing Technologies for Sustainable Development**

## **Status of biotechnology in Africa**

11. In this section, focus will be on agriculture whose poor performance is singled out as the most important factor responsible for Africa's poverty, hunger, poor health and degradation of natural environment.

12. Status of biosafety in Africa:

- South Africa, Malawi, Mauritius and Zimbabwe have GM legislation and functioning GMO biosafety/decision-making processes
- Ghana has recently put in place its biosafety framework
- Egypt, Uganda and Kenya have linked their biosafety process to existing legislations as an interim mechanism while biosafety legislation is processed
- Zambia, Cameroon and Nigeria have draft biosafety frameworks
- Forty three African countries are developing biosafety frameworks through UNEP/GEF projects.

13. It appears that only 4 countries have fully met the biosafety requirement needed for biotechnology development, transfer and application. Three countries are using other existing legislations. One country is yet to make its biosafety framework functional.

## Investment in Agricultural Biotechnology

14. Investment in agricultural biotechnology is considerable globally and in countries committed to applying biotechnology. For example, in 1995, Research and Development (R&D) investment in agricultural biotechnology worldwide was US\$ 2.75 billion including US\$2 billion for USA alone. In 2001, this investment increased to US\$ 4.4 billion. India and Brazil are investing respectively US\$ 25 and US\$15 million per year (James C.2003). China invested US\$300 in agricultural biotechnology R&D in 2001 alone (Kalaitzandonakes, 2002) cited by James (2003).

15. Recently, USA invested US\$10 billion in biotechnology R&D. This created 140,000 new jobs and generated US\$18 billion worth of revenue. Europe which is seen as the citadel for anti-biotech groups, has over 1040 high-tech and GM companies investing hundreds of million of Euros annually and employing tens of thousands of Europeans.

16. In Africa, investment in agricultural R&D has not been sustainable. After an encouraging increase throughout 1960s and early 1970s, growth of this investment largely stopped in the late 1970s. As a consequence, real spending per scientist has fallen by 2.6 per cent per year since 1961 with the rate of decline accelerating from 1.6 per cent a year during the 1960s to 3.5 per cent a year in the 1980s. It is likely that this decline has further accelerated in 1990s and beyond and that investment in agricultural biotechnology R&D is poor in the region.

17. In fact, James (2003) estimated at only US\$25 million the total agricultural biotechnology R&D investment in 2001 by South Africa, Egypt, Zimbabwe, Kenya, Pakistan, Malaysia, Thailand, Indonesia and the Philippines. Nigeria, which was late to join African major investors, was, however, reported to have committed to medical and agricultural biotechnologies a sum of US\$ 263 million per year for three years.

### GM product innovation

18. In Africa, no country has reached the innovation stage of product biotechnology development. First and second generation biotechnology (fermentation, conventional breeding, tissue culture) is sparsely established on the continent with some pockets of excellence. Genetic modification development and testing are evident in Egypt, Uganda, Kenya, Zimbabwe, Mauritius and South Africa. Burkina and Mali are testing Bt cotton engineered by Monsanto.

### Commercial production of GM crops

19. The production of GM crops worldwide has increased 47-folds from 1.7 million hectares in 1996 to 81 million hectares in 2004 despite existing controversies. The rate of increase from 2003 to 2004 is estimated at 20 per cent. Seventeen countries produced GM crops in 2004 and South Africa was the only African country among them. USA was ranked first with 47.6 million ha followed by Argentina, (16.2 million ha); Canada, (5.4 million ha); Brazil, (5 million ha); China, (3.7 million ha); Paraguay, (1.2 million ha) India, (0.10 million ha); and South Africa, (0.5 million ha).

### Main constraints to biotechnology uptake in Africa

20. The main constraints to the uptake of biotechnology in Africa are the following:

- Lack of political will in many countries;
- National biotechnology policy and national biosafety legislation are not in place;
- Poor funding at national level;
- Poor human and institutional capacities;
- Lack of sub-regional and regional harmonization; and
- Unfair international trade.

## **Biotechnology - Related Activities of ECA**

### Background

**(Ref. CSD.3 Science and Technology parliamentary document)**

21. ECA's biotechnology related work began in 1992. During the period 1991-2001, this work was essentially devoted to the production of technical documents aimed at raising awareness of African policy makers on the challenges and opportunities of modern biotechnology, especially as it relates to agriculture development. Approved work programmes have no component exclusively devoted to the promotion of biotechnology. The period was followed by the 2002-2003 biennium characterized by a drastic change in approach to addressing biotechnology issues. From that period onwards, biotechnology became a part and parcel of the approved work programme of the Commission. Focus was on sustainable development with efforts directed at policy issues applied to food and agriculture, health, industry, natural resources/environment and energy. Activities related to international cooperation and inter-agency coordination and liaison on biotechnology affairs were also part of the work programme.

22. The Commission held, for the first time, an expert meeting on biotechnology for Africa's sustainable development in July 2002. This meeting brought together distinguished experts from the private and public sectors, civil society, United Nations organizations, OAU/AU and other stakeholder institutions.

23. The meeting provided participants with a better understanding of benefits and risks associated with the use of modern biotechnology. It also reviewed the progress made by African countries towards meeting requirements for the realization of the promise of biotechnology in Africa. The meeting further assisted in the formulation and provided guidance for the implementation of an ECA's biotechnology programme. It made recommendations towards the development of the technology for sustainable development in the region.

24. One the most publicized biotechnology-related initiatives in 2002 was the launching of a report, "Harnessing technology for sustainable development", at the World Summit on Sustainable Development (WSSD).

25. The report demonstrates the great potential of medical and agricultural biotechnologies to succeed where conventional technologies have failed or performed poorly (inadequately) and highlights the challenges and potential risks associated with the application of the underlying biotechnologies. Africa's low technical capacities and very limited financial resources available for biotechnology research were underscored.

26. The report concludes that "the biggest risk for Africa would be to do nothing, allowing biotechnology revolution to pass the continent by", creating what Serageldin (1999)<sup>1</sup> referred to as a 'scientific apartheid' with the benefits of biotechnology reserved for industrial countries and large-scale farming.

### **UN-Biotech/Africa-related activities**

27. ECA also spearheaded a new partnership among UN institutions for a coordinated support for biotechnology uptake in Africa. In April 2003, a proposal for the creation of a forum to be called 'Inter- Agency Partnership on Biotechnology for Africa's Development' or UN-Biotech/Africa was developed by a Consultative Group comprising many UN institutions involved in biotechnology related activities in Africa. These are ECA, WHO, UNESCO, WFP, UNIDO, FAO, UNEP and UNDP.

28. The expected added value of UN-Biotech/Africa, as underscored by the Consultative Group, is the enhancement of the UN work in the field of biotechnology in Africa, that is to be achieved by complementing the programmes and activities of various bodies of the UN system. The key but by no means the only benefits to be derived from UN-Biotech/Africa, as also underscored by the Group, include (i) coordination of policies, strategic approaches and actions among agencies and programmes of United Nations system in relation to biotechnology development acquisition and diffusion in Africa; (ii) generation of synergies between activities of the UN institutions so as to produce greater impact through greater efficiency in the use of UN human and financial resources

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<sup>1</sup> Serageldin, I. 1999. Biotechnology and food security in the 21<sup>st</sup> Century. Science 285 (16 July):387-389.

that are directed at the development, acquisition and diffusion of biotechnology in Africa; and (iii) creation of an effective platform of exchange of biotechnology-related information, experiences and perspectives.

#### Biennium 2004-2005

29. 36. Three biotechnology-related outputs were approved for the biennium 2004-2005 in addition to activities associated with international cooperation and inter-agency coordination and liaison. They are: (i) Group training on management of biosafety and intellectual property rights; (ii) Field project on programme for promoting biotechnology for sustainable development in Africa; and (iii) Report to the CSD on the ECA programme for promoting biotechnology in Africa.

#### *ECA organized its first biotechnology training workshop*

30. The first biotechnology-related training workshop ever organized by ECA was on Intellectual Property Rights (IPRs). The workshop was held from 3 March to 2 April 2004 in Dakar, Senegal, in collaboration with Michigan State University (MSU), University of Dakar, American Embassy in Senegal and the United States Agency for International Development (USAID).

31. Its overall objective was to help countries of the West and Central Africa acquire literacy on matters regarding IPRs and to develop and implement related legal frameworks and guidelines needed for biotechnology development, transfer and application.

32. Fifty-seven participants from Benin, Burkina Faso, Gabon, Niger, Mali, Senegal, Cameroon, Togo, USA, CORAF/WACARD and Inter-States School of Science and Veterinary Medicine attended the workshop. Topics of the lectures included: Introduction to Intellectual Property (IP), national and international treaties and laws related to IPRs and technology transfer, public and private sector perspectives on IPRs and transfer of technology, management of IP, and day-to-day management of IPs at the university.

33. The training workshop was remarkable for it was successfully organized, timely and very useful as judged by the participants. ECA plans to replicate it for the remaining African sub-regions in the future.

#### *ECA intensified efforts towards the institutionalization of UN-Biotech/Africa*

34. Another momentous contribution ECA made during the current biennium, with respect to the promotion of biotechnology in Africa, is the approval and funding of a project on data collection missions to the head offices of all the UN institutions involved in the UN-Biotech/Africa initiative.

35. The project's overall objective was a review of biotechnology programmes and activities for Africa's development of UN bodies so as to identify the key priority areas and modalities for joint actions by these bodies. The mission was undertaken in April and May 2005 to the head offices of the World Bank, UNDP, UNIDO, WHO, UNESCO, FAO and UNEP.

36. The following is a summary of the findings on the work of UN organizations, that has directly or indirectly provided support to the promotion of biotechnology in Africa. These findings

are regrouped in five categories according to the programme areas described in chapter 16 of Agenda 21. They are being reviewed in order to identify related needs and gaps, identify areas of joint interventions, and formulate a well-informed UN-Biotech/Africa work programme including modalities of cooperation.

*Increasing the availability of food, feed and renewable raw materials*

37. FAO, the leading UN organization promoting agricultural biotechnology in developing countries, established the Biotechnology Applications in Food and Agriculture, Forestry and Fisheries Priority Area for Interdisciplinary Action (Biotechnology PAIA) and set up an Inter-Departmental Working Group to oversee its planning and implementation. Biotechnology PAIA provides FAO members and their institutions with factual, comprehensive and current information on international developments relating to biotechnology applications.

38. FAO's internet-based information tools on biotechnology are: the FAO website on biotechnology, (in English and French); an electronic newsletter FAO-BiotechNews (in English and French); FAO Electronic Forum on biotechnology in food and agriculture which serves as a neutral platform for the exchange of views and experiences on biotechnology in food and agriculture for developing countries; a series of nine articles under the heading "***Agricultural biotechnology: Will it help?***" published in English and French and designed to provide non-specialists with information on current and potential applications of biotechnology on food production, including arguments for and against the use of GMOs; the FAO Glossary of Biotechnology for Food and Agriculture, a multilingual database containing definitions of about 3 200 terms and acronyms; the State of Food and Agriculture; the FAO-BioDeC, a searchable database on crop biotechnology products and techniques in use in developing countries.

39. The electronic Forum hosts and moderates e-mail conferences on topics such as the impact of biotechnology on the different food sectors; hunger and food security; intellectual property rights (IPRs) on agricultural biotechnology; gene flow from GMOs to non-GM populations; and the role of biotechnology in the agricultural research agendas of developing countries.

40. The 2004 edition of State of Food and Agriculture was themed "Agricultural Biotechnology: Meeting the needs of the poor?". It was presented under three main headings which are: framing the debate; the evidence so far; and making biotechnology work for the poor. The publication can also be accessed online.

41. FAO and IAEA jointly held an international symposium on Biotechnology Applications for Livestock Development in 2003. The proceedings of this symposium have been published, which covers all uses of modern biotechnology for improving nutrition, diagnosis and disease control kits.

42. UNESCO's Biotechnology Action Council (BAC) focuses on the applications of biotechnology in plants and marine life, especially in food production through agriculture, mariculture and aquaculture. This program serves as an umbrella for five Biotechnology Education and Training Centres (BETCEN) located in each region. BETCENs provide research and training opportunities at the regional level in the diverse aspects of biotechnology and its potential applications.

*Improving human health*

43. WHO's biotechnology-related activities cover a broad variety of areas including blood transfusion safety, blood products, laboratory services, diagnostic radiology and other medical devices, surgery, anesthesiology, transplantation, eHealth, genomics, food safety and technology assessment.

44. WHO also provides norms, standards, guidelines, advocacy, as well as training materials and technical assistance at the country, regional and global levels. Further, WHO is primarily charged with ethical and safety issues concerning tissue banking. Its Quality Assurance and Safety of Medicine group is charged with developing standards and monographs for international pharmacopoeia.

45. WHO's Regional Office for Africa (AFRO) and its African AIDS Vaccine Programme (AAVP) for HIV/AIDS project in Africa work in close collaboration with IAEA known to have Technical Cooperation Projects (TCPs) in nuclear medicine involving molecular biology techniques for epidemiology, diagnosis, prognosis and detection of drug resistance for communicable and non-communicable diseases.

*Enhancing protection of the environment*

46. UNEP is the leading UN organization for the programme area on environment protection. In focusing on biosafety, it promotes understanding of the implications associated with the release of GMOs into the environment as well as issues related to their transboundary movement.

47. It has provided support to the development of national biosafety frameworks (NBF) including capacity building for their implementation, awareness raising and exchange of information on economic opportunities and environmental challenges arising from the adoption and application of GMOs at the national, regional and global levels.

48. As one of the implementing agencies of the Global Environment Facility (GEF), it is currently assisting about 123 countries worldwide, including 40 countries from Africa to prepare their National Biosafety Frameworks (NBFs); providing more than eight countries with demonstration projects for the implementation of their NBFs; and facilitating access and benefit from the Biosafety Clearing House (BCH) under the Cartagena Protocol to around 140 countries.

49. UNEP supports the Information Resource on the Release of Organisms into the Environment (IRRO), a global service on GMOs.

50. UNIDO, in collaboration with the Common Fund for Commodities, is undertaking a project on the use of enzymes in paper pulp production from green jute and kenaf. The project, which has been very well received by industries in India and Bangladesh, could be implemented in Africa as well.

51. FAO held, in 2003, an expert consultation on the Environmental Effects of Genetically Modified Crops. The consultation emphasized that all potential environmental benefits and hazards should be considered within the broader ecosystem and addressed on a case-by-case basis.

52. It underscored the need to quantify the short- term, long-term and large-scale effects of modern biotechnology, including gene flow, food safety as well as the changes in agricultural inputs (e.g. pesticides or fertilizers) and practices.

53. FAO has received requests for assistance in building or strengthening national biosafety systems, including development and implementation of regulations, training of personnel of regulatory bodies in risk analysis of GMOs, and upgrading of laboratory capacities from a number of countries. It has completed or is currently implementing technical cooperation projects in several countries, including Bolivia, Grenada, Kenya, Malaysia, Paraguay and Swaziland.

54. FAO is currently preparing a review entitled ‘‘Preliminary Review of Biotechnology in Forestry Including Genetic Modification’’ that will compile four different studies on the status and trends of research and applications of biotechnology to forest woody species.

*Enhancing safety and developing international mechanisms for cooperation*

55. UNEP has, since 1999, been working closely with Multilateral Environment Agreements (MEAs) secretariats and the WTO to build synergies between the multilateral environmental and trade regimes.

56. Further, with the entry into force of the Biosafety Protocol in September 2003, UNEP has provided impetus for the development of regulatory frameworks for the use of and trade in Living Modified Organisms (LMOs) at the international and national levels. This Protocol has produced the coherence between environment agreements and trade regimes even more imperative.

57. UNEP supports the parties to the Biosafety Protocol in minimizing environmental risks associated with trade and use of LMOs. It helps to ensure that benefits are maximized.

58. FAO and WHO have jointly held expert consultations on the safety assessment of foods derived from GMOs. Accordingly, the Codex Alimentarius Commission has adopted principles for risk analysis of these organisms and guidelines for safety assessment of foods derived from recombinant-DNA plants and those from recombinant-DNA microorganisms. The guidelines can be used by governments as basic protocols in evaluating safety of the underlying products.

59. FAO also published a legislative study in 2003 on ‘‘*Law and Modern Biotechnology: Selected Issues of Relevance to Food and Agriculture*’’. The study included three categories of legal instruments at the international and national levels in the areas of biosafety, food safety and consumer protection.

60. FAO organized a workshop, in collaboration with the University of Tor Vergata (Italy), to assess the impact of IPRs on biotechnology R&D within the food and agricultural sector of developing countries. It also looked into the ensuing policy issues and options open under the WTO-TRIPS Agreement.

61. A FAO-ISNAR workshop in 2002 on Policy Planning and Decision-Support for Biosafety resulted in a decision support system (DSS) on biosafety, which has since been developed in

consultation with UNEP-GEF. The DSS aims at helping countries meet international and regional obligations concerning agricultural biotechnology.

62. UNIDO, one of the first organizations to call for biosafety measures, has established the "Biosafety Information Network and Advisory Service (BINAS)" and developed a computer-based decision support system for the assessment of environmental impacts resulting from experimental and commercial releases of biotechnology-derived products. It has been streamlining the activities of its Biosafety Clearing House in light of ongoing capacity-building programmes of the GEF and UNEP, focusing instead on providing information and training on biosafety.

63. UNIDO has also prepared a proposal entitled "Biosafety Decision-Support Resource (BDR)" in collaboration with CAB International, a leading non-for-profit organization dedicated to the generation, dissemination and use of applied bioscience to enhance development.

64. UNIDO, in collaboration with the Government of Chile, organized a Global Biotechnology Forum in 2004. The objective was to ensure that biotechnology is harnessed fully in the pursuit of major development initiatives such as the MDGs, the Global Compact for Corporate Social Responsibility and NEPAD.

65. One of the outcomes of the global forum was the establishment of the UN Inter-agency Cooperation Network on Biotechnology (IACNB) which, in addition to strengthening coordination of biotechnology-related activities within the UN system, is to serve as a global multi-stakeholder forum on biotechnology. The name 'IACNB' will soon be replaced by UN-Biotech based on the recommendation of ECA.

66. On FAO's website on biotechnology and food and agriculture is a paper recently produced by UNCTAD on International Trade in GMOs: *Legal Frameworks and Developing Country Concerns*. This paper is being used as a teaching material by Harvard and Cornell universities. The UNEP-GEF project on development of national biosafety frameworks, UNEP-GEF Biosafety Unit, is also using the paper in its technical cooperation activities.

*Establishing enabling mechanisms for the development and the environmentally sound application of biotechnology.*

67. UNIDO has affiliated with ICGEB to establish a repository of collected information on research and development activities in member States, including information on commercial products and technologies developed by institutes in member States and on patent laws, release of genetically engineered micro-organisms/products and biosafety legislation.

68. FAO's Biotechnology PAIA is currently preparing the "FAO Agriculture Biotechnology Policy Compendium: Options and Impacts" which will cover, inter alia, regulatory frameworks and legal instruments for fostering research and technology transfer and for assessing safety, capacity-building, and societal dialogue. This compendium is to be used in capacity-building workshops, distance learning courses and other outreach activities.

69. FAO has sponsored, in collaboration with the World Bank, USAID, Michigan State University-Agricultural Biotechnology Support Project, the Crop Science Society of America and the American Society of Agronomy, a symposium on "Plant Biotechnology: Perspectives from Developing Countries". A set of recommendations for building developing countries' capacity in plant biotechnology were made by the symposium.

70. UNESCO has organized the 'World Conference of Science' in Budapest in 1999. This Conference has emphasized the need to integrate ethics in the development and use of science. It has underscored the need to improve access to and ensure benefits sharing from biotechnology, as well as the protection of intellectual property rights, as inherent considerations in science and technology development and application.

71. UNESCO also ran a specialized programme on Biotechnology for Development in Africa from 1996-2001, in keeping with its mainstreaming priorities.

72. UNDP does not work directly in the area of biotechnology nor does it collaborate with other UN bodies in this area. However, it maintains an active interest on this issue in as much as it impacts its work on poverty alleviation and is a co-sponsor of the 'Consultative Group on International Agricultural Research (CIGIAR)'.

73. UNDP outlined its views on biotechnology in the 2001 edition of its Human Development Report entitled "Making New Technologies Work for Development".

74. These views are that: (a) Biotechnology appears to have the potential to bring great benefits but that research has been inadequate; (b) Some forms of biotechnology are not controversial, and should therefore be accessible to all countries; (c) Countries have the sovereign right to decide whether or not to import transgenic organisms, and full disclosure of the presence of these organisms should be made; (d) Where genetically-modified (GM) grain is sent as food aid to countries that have rejected biotechnology, WFP's pragmatic step in sending milled GM foodstuffs to these countries is commendable; and (e) Opinions on biotechnology are, oftentimes, based on lack of information, and developing countries are at a disadvantage regarding access to information and expertise to guide their decision-making process.

#### Other Activities: international cooperation and inter-agency coordination and liaison

75. Upon requests from its member States, ECA was represented at five regional or sub-regional biotechnology-related conferences, meetings or workshops since 2002. These were: the workshop on multi-national project for the formulation of the African Programme for the development of commercial biotechnologies (Algiers, Algeria, 12 – 16 October 2003); the third Annual Conference on USAID-African Partnership in Strategies for Biotechnology in Africa (Ibadan, Nigeria, 17-19 November 2003); the Ministerial Conference on Harnessing Science and Technology to increase Agricultural Productivity in Africa: West African Perspectives (Ouagadougou, Burkina Faso, 21-23 June 2004); the CORAF/WECARD's First Stakeholders' Meeting on Biotechnology/Biosafety (Abuja, Nigeria, 18-22 October 2004); and the Ministerial Conference of ECOWAS States on Biotechnology (Bamako, Mali, 21-24 June 2005).

76. ECA not only contributed to the deliberations of all the meetings and conferences but also provided them with needed technical assistance and advocacy services.

77. ECA was also engaged in discussions leading to concrete partnership arrangements. In Algiers, it provided direct technical assistance for the identification of the conditions for the implementation of a project on commercial biotechnologies designed by the African Agency of Biotechnology.

78. In Ibadan, it (a) made a presentation on the status of its biotechnology initiatives for Africa and how these initiatives could complement the USAID efforts and other initiatives, and (b) initiated ECA-USAID partnership discussions.

79. In Ouagadougou, it (a) made an advocacy presentation entitled “UN-Biotech/Africa: accelerating responses to Africa’s development challenges; (b) proposed the endorsement of the initiative to establish UN-Biotech/Africa by African Ministers responsible for biotechnology-related affairs; (c) proposed the creation of a high-level ministerial forum to be called “Conference of African Ministers on Biotechnology or CONAMB” that is to be used by African countries to discuss biotechnology issues and make common and informed decisions on these issues, and (d) pursued discussions on ECA-USAID and other partnership arrangements.

80. In Abuja, ECA provided technical assistance for the identification of biotechnology/biosafety-related research capacity needs of the countries of CORAF/WECARD sub-region.

81. In Bamako, it discussed at length partnership possibilities with UNEP particularly for the joint organization in Accra of a biosafety training workshop for ECOWAS countries.

### **Constraint**

82. The lack of financial resources is the single most important constraint to the effective promotion of biotechnology in Africa by ECA. Only a small fraction of the programmes and activities listed earlier in this report is funded by the regular budget approved for the biennium under review. For example, of the three outputs approved for the biennium 2004-2005, only the “Report to CSD on the ECA programme for promoting biotechnology in Africa” is accounted for in the regular budget. The two other outputs from which this report is to be derived were to be funded by extra-budgetary resources.

### **Achievements/Impact**

#### *Progress towards mainstreaming biotechnology in ECA programmes of work*

83. Despite the constraint mentioned above, considerable progress has been made in planning and implementing biotechnology-related activities at ECA. This is particularly evidenced in the incorporation of biotechnology in the Commission’s approved work programmes.

#### *Contribution to awareness creation*

84. There is increasing evidence that African policy makers are moving towards a better understanding of the potential role that modern biotechnology can play in the development of their

countries if used safely. For example, many regional, sub-regional and national conferences, meetings and workshops have been hosted by these countries on opportunities, challenges or risks associated with the tool.

85. African Heads of State have unanimously recognized the critical importance of biotechnology in the NEPAD. ECOWAS countries have held two ministerial conferences devoted to biotechnology and a third one is planned for June 2006. African regional and sub-regional institutions such as FARA, ASERECA, CORAF/WECARD, and African Biotechnology Agency are working to promote effective development, transfer and application of biotechnology in Africa.

86. ECA's contribution to the above development has been largely through publications, expert group meetings and presentations at various technical meetings and conferences.

87. The most remarkable evidence of the impact of ECA's advocacy work on the African policy decision makers is the acceptance by Ministers of ECOWAS to work towards the creation of an "African Ministerial Conference on Biotechnology" as recommended by the Commission at the Ministerial Conference held in Ouagadougou in 2004.

88. This Conference made a declaration which calls for the "institutionalization of a Conference of West African ministers of agriculture as a first step towards the creation of a " Conference of African Ministers on Biotechnology". In June 2005, the Ministerial Conference of ECOWAS held in Bamako, Mali, as a follow-up to Ouagadougou conference, declared as follows:

89. " The conference after having examined the possibilities given by the revised ECOWAS treaty, particularly in its Chapter 3, has decided to institutionalize the ministerial conference on biotechnologies. To do this, the conference has invited the Executive Secretary of ECOWAS to:

- Take all necessary arrangements for the organization on an annual basis of a West African ministerial conference on biotechnologies, and
- Make the contact with the Commission of African Union for the organization of an African conference on biotechnologies"

*Contribution to the establishment of enabling mechanisms for the development and the sound application of biotechnology in Africa.*

90. ECA's initiative to create and implement UN-Biotech/Africa to foster partnership among UN institutions in support of biotechnology in Africa has been appreciated by these institutions and African policy makers. This initiative is in line with the prescription in the fifth programme area (i.e. *establishing enabling mechanisms for the development and application of environmentally sound biotechnology*) of the Chapter 16 of Agenda 21 and was endorsed in June 2004 by the Ouagadougou Ministerial Conference mentioned earlier.

91. UNIDO, WHO, FAO, UNEP, UNESCO have agreed to join hands with ECA to make the UN-Biotech/Africa operational. To show their goodwill, in this regards, all these UN institutions have accepted to co-organize with ECA a biosafety training workshop and the UN-Biotech/Africa inaugural meeting respectively in Accra (Ghana) and Addis Ababa (Ethiopia) before the end of 2005.

## **The Way Forward**

92. In the remaining months of the biennium 2004-2005 and the near future, ECA's activities will center on:

- Validation and launching of UN-Biotech/Africa in partnership with UNIDO, UNESCO, WHO, FAO and UNEP;
- Organization of a biosafety workshop in Accra, in collaboration with UNIDO, UNESCO, WHO, FAO, UNEP and the Government of Ghana;
- Implementation of UN-Biotech/Africa work programme in partnership with other UN bodies or organizations; and
- Pursuit of actions to reinforce partnership among UN institutions as called for by the GA resolution A/RES/58/200 and of relevant activities for biotechnology uptake in African countries. These activities will include capacity building, more awareness creation, information and communication, and technical assistance.

## **Conclusion**

93. Biotechnology is the leading technology of the 21<sup>st</sup> century. The challenges associated with its application are many but more so are its related opportunities and benefits.

94. Africa stands to gain considerably towards poverty reduction from modern biotechnology if it applies this tool safely. Unfortunately, the continent has yet to meet the basic mandatory requirements such as functional biosafety legal frameworks, human and institutional capacities and sufficient investment in biotech research and development.

95. ECA has been assisting Africa since the 1990s to overcome the constraints to the promotion of biotechnology in the region. It has produced and disseminated advocacy technical materials and provided technical assistance.

96. ECA has been involved in capacity building and has built partnership outside and within the UN system in support of the safe use of the tool in Africa. Its UN-Biotech/Africa initiative stands to bring together UN institutions to assist NEPAD in the field.

97. In the years ahead, it will pursue its activities in support of the promotion of biotechnology in Africa in the areas of interest to its member countries. Implementation of UN-Biotech/Africa, capacity and partnership building, awareness creation, information and communication, and technical assistance will be among these activities.