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FAO AND BIOTECHNOLOGY

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Report Highlights:

FAO views biotechnology in the context of its mandate to promote food security and increase agricultural productivity. It recognizes biotechnology as a suite of tools that have great potential to improve the productive capacity of agriculture in the developing world, but also recognizes there are substantial obstacles to be overcome. FAO's general position on biotechnology can be characterized as cautious. It plays an important and useful role in the global dialogue on biotechnology, but lacks a sense of urgency in helping to equip countries with the tools to use biotechnology.

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FAO AND BIOTECHNOLOGY

I. Overview

FAO views biotechnology in the context of its mandate to promote food security and increase agricultural productivity. It recognizes biotechnology as a suite of tools that have great potential to improve the productive capacity of agriculture in the developing world. However, many developing countries are unable to take advantage of the potential benefits of biotechnology because they lack the necessary infrastructure for research and development, regulatory decision-making, and policy-implementation. FAO sees its role as helping to overcome these obstacles by equipping developing countries with the means to determine whether, how, and under what conditions to use biotechnology.

FAO strives to be neutral in its role as a disseminator of information and knowledge. It serves as a forum for dialogue on biotechnology issues and provides technical assistance and capacity building, especially in the regulatory area. It is also home to two international standards-setting bodies with a direct impact on international regulatory issues concerning biotechnology – the Codex Alimentarius Commission, which is responsible for food safety, and the International Plant Protection Convention, which is responsible for plant pest and disease prevention.

II. FAO's Position on Biotechnology

Evaluation of the safety of biotechnology applications in agriculture has been one of FAO's primary concerns. It has consistently advocated in favor of science-based safety assessments on a case-by-case basis. In general, FAO has concluded that, given the current state of biotechnology applications, potential environmental impacts are a greater concern than food safety issues.

FAO has also attempted to call attention to a number of other issues in addition to safety evaluation. The need for greater investments in public sector research has been a recurring theme. FAO frequently notes that the investment by the biotechnology industry in research and development is more than ten times the total crop improvement budget of the CGIAR system, and the industry research is targeted primarily at crops that are not the most critical for the developing world. A related issue of concern to FAO is the use of intellectual property protection by the biotechnology industry, which is seen as putting up an obstacle to developing country access to new technologies.

FAO's general position on biotechnology can be characterized as cautious. The focus is more often on the obstacles than on the potential. By describing its role as providing a neutral forum for debate and the dissemination of information and knowledge, FAO is positioning itself apart from the usual pro-con debate. With this approach FAO is playing an important and useful role in the global dialogue on biotechnology. The downside, however, is that FAO brings no sense of urgency to the task of helping to equip developing countries with the tools to use biotechnology. In fact, the Director-General on several occasions has stated that biotechnology is not a priority for the short-term goal of reducing the number of hungry people in the world by 2015, though it will be important to providing sustainable global food supplies by 2050.

Early Work

FAO's first efforts to develop a comprehensive approach to developments in the field of agricultural biotechnology date back to 1999. In January of that year FAO presented to the Fifteenth Session of the Committee on Agriculture a [survey paper](#) on biotechnology applications in agriculture and FAO's work in the area. This paper places biotechnology squarely within the framework of FAO's mandate to improve food security in developing countries. Biotechnology is characterized as "a powerful tool in agricultural development." After discussing a number of obstacles to the use of biotechnology in developing countries, the paper declares that FAO's role is to help members "optimize their capacity to develop, adapt and utilize biotechnology and its products." FAO's three principal functions are identified as policy advice, information exchange and capacity building. Because biotechnology issues cut across FAO's organizational structure, the paper also recommends establishing an inter-sectoral program for biotechnology within the organization.

This was the first time biotechnology had been placed before an FAO governing body as a policy issue. The Committee on Agriculture (COAG) largely endorsed the paper, recommending that FAO "develop a strategic approach to biotechnology and give high priority to a coordinated cross-sectoral program". The COAG also recognized and encouraged FAO's involvement in all of the major international biotechnology policy exercises underway at that time – the Cartagena Protocol on Biosafety, the risk assessment harmonization efforts of the Codex Alimentarius and the International Plant Protection Convention, the negotiation of the International Treaty on Plant Genetic Resources for Food and Agriculture, and the work on labeling in the Codex Alimentarius Commission. The FAO Council subsequently endorsed the proposal for an organization-wide program on biotechnology in June 1999. It also underscored FAO's role as "an 'honest broker' of quality science-based information" in relation to biotechnology.

In November 1999, FAO presented its proposed actions to follow-up on the recommendations of the COAG and Council in an [Information Note on Biosafety](#), which was submitted to the FAO Conference. In this document FAO puts a high priority on harmonization of biosafety regulations relating to the testing and release of GMOs. In addition to the risk assessment harmonization efforts already underway in Codex and IPPC, FAO recognizes the need to address issues related to transgenic animals and fish and the use of GMOs in animal vaccines and diagnostic kits. Other actions include providing technical advice and capacity building on issues such as implementation of the Biosafety Protocol, establishment of regulatory bodies, and risk assessment capacity. The FAO position on biotechnology has not been revisited by any of the governing bodies since 1999.

Based on the documents presented and the guidance provided over the course of 1999, FAO could have been expected to focus its efforts on helping developing countries to realize the potential benefits of agricultural biotechnology. While substantial efforts have been made over the last 6 years in that direction, the official FAO Statement on Biotechnology and the speeches and statements of the Director-General and other senior executives have emphasized the need for caution.

FAO's Statement on Biotechnology

FAO's [Statement on Biotechnology](#) was issued in March 2000 on the occasion of the first meeting of the Codex Ad Hoc Intergovernmental Task Force on Foods Derived from Biotechnology. The press release accompanying the statement was headlined "FAO Stresses Potential of Biotechnology but Calls for Caution". The statement acknowledges "biotechnology provides powerful tools for the sustainable development of agriculture, fisheries and forestry and can be of significant help in meeting the food needs of a growing and increasingly urbanized population." However, it also urges a "cautious case-by-case approach to determining the benefits and risks of each individual GMO."

Since 1999, the FAO Director-General, Jacques Diouf, has given several speeches in which he specifically addresses the issue of biotechnology ([2000](#), [2001](#), [2005](#)). In these speeches he extols the potential of biotechnology, but at the same time highlights a list of safety concerns and obstacles to utilization of the technology in the developing world. The safety concerns are primarily ecological risks and food safety, both of which FAO is addressing through its regulatory harmonization efforts. The obstacles cited include lack of research focused on developing country crops, restrictive use of intellectual property rights, and ethical concerns, such as the consumer's right to choose. Speeches by FAO Assistant Director General Louise Fresco ([2001](#), [2003](#)) and James Dargie, former Director, Joint FAO/IAEA Division ([2001](#)), echo most of these issues.

2002 Food Aid Crisis

The GM food aid crisis in 2002 put FAO in the middle of the public controversy over biotechnology. With more than 13 million people facing starvation in southern Africa, Zambia, Zimbabwe and Mozambique rejected U.S. corn supplied as food aid, ostensibly because it was genetically engineered. FAO representatives in the region were supplying governments with advice that created further confusion and controversy over the safety of genetically engineered foods. Citing concerns about undermining the ongoing CODEX review of genetically engineered foods, FAO officials at headquarters were reluctant to step in with an unambiguous statement that the weight of scientific evidence demonstrates no additional risk to human health. Instead, FAO suggested mitigating the risks by milling the corn before distributing it as food aid. Finally, in August 2002, FAO, WFP and WHO released a joint [UN Statement Regarding the Use of GM Foods as Food Aid in Southern Africa](#), which said the food aid containing GMOs being distributed in southern Africa was "not likely to present human health risks."

2004 SOFA Report

The publication of the [State of Food and Agriculture 2003-2004](#) (SOFA Report) marks a significant shift in FAO's public posture on biotechnology. The report openly embraces the potential of biotechnology to meet the needs of poor farmers in developing countries. It concludes that biotechnology, while not a panacea, can provide both economic and environmental benefits for developing countries. The main obstacles to realizing these benefits are the lack of biotechnology innovations targeted at developing countries and inadequate scientific, technical and regulatory capacity in those countries. To overcome these obstacles, the report recommends greater public and private sector research directed towards biotechnology innovations specifically for developing countries and a heightened focus on regulatory capacity building.

Overall the SOFA Report is a positive contribution to the international debate. Because it recognizes both the scientific consensus about the safety of biotechnology applications in agriculture and the significant potential economic and environmental benefits for poor farmers in developing countries, the report was attacked in a letter signed by over 800 NGOs and members of civil society for being too pro-biotech. (See [NGO letter](#).) In response to this letter, the Director-General issued a [press release](#) in June 2004 that took a much more cautious tone than the report itself. Rather than reinforcing the report's message about the potential of biotechnology, he emphasized the need for international rules governing the use of biotechnology and noted the lack of private sector investment in products of interest to developing countries.

III. Organization of Biotech Activities within FAO

In the [2002-2007 Medium Term Plan](#) FAO identified a number of Priority Areas for Inter-Disciplinary Action (PAIA), among which were two directly related to biotechnology. PAIAs were developed to enhance coordination across FAO departments, particularly in areas that would benefit from the central budget and program planning process. Most of FAO's biotechnology related activities are covered by one of these two PAIAs.

PAIA on Biotechnology in Agriculture, Fisheries and Forestry

The Biotechnology PAIA is focused on FAO Corporate Strategy C – creating sustainable increases in the supply and availability of food and other products from the crop, livestock, fisheries and forestry sectors. The decision to create the Biotechnology PAIA was a response to repeated calls from FAO Governing Bodies for FAO to “engage actively in current debates on biotechnology and genetically-modified organisms (GMOs), through science-based contributions.”

The 2002-2007 Medium Term Plan identified the scope of work under this PAIA as assessing the biotechnology needs of developing countries, assisting developing countries with formulation of biosafety regulations, providing policy advice, developing a biotechnology section on the FAO website, and developing a comprehensive database on biotechnology issues. The indicative budget resources associated with this PAIA in the [2002-2003 Program of Work and Budget](#) were \$4.5 million. (The budgets for the 2004-2005 and 2006-2007 biennia not contain the indicative budget amounts associated with each PAIA.) In the Medium Term Plans for [2004-2009](#) and [2006-2011](#) there has been no significant shift in the scope of work.

The Biotechnology PAIA is coordinated by the [Inter-Departmental Working Group](#) on Biotechnology (IDWGB), which includes representatives from each of the departments whose work contributes to the PAIA. Programs under the Agriculture Department, in particular the Agricultural Support Systems Division and the Joint FAO/IAEA Division, are the largest components of the Biotechnology PAIA.

PAIA on Biosecurity for Agriculture and Food Production

The Biosecurity PAIA contains significant biotechnology elements but is not focused on biotechnology. It includes the biotechnology related standards-setting work of the Codex Alimentarius Commission and the Interim Commission on Phytosanitary Measures, as well as capacity building for biotechnology regulations.

IV. Normative Activities

IPPC

The International Plant Protection Convention (IPPC) provides the mechanism for setting global phytosanitary standards. At the second session (October 1999) of the Interim Commission on Phytosanitary Measures (ICPM), which is the temporary governing body for the IPPC, a number of members placed a high priority on developing standards for pest risk assessments and testing procedures for genetically engineered plants. An exploratory open-ended working group was formed to develop a statement on “the role of the IPPC in assessing the plant pest risks of GMO's” and to “consider the necessity of developing and adopting international standards under the IPPC.” The [report of the exploratory working group](#) was presented to the third session of the ICPM in April 2001. The ICPM endorsed the working group's statement that plant pest risks of LMOs fall clearly within the scope of the IPPC and adopted the recommendation to develop a standard to specifically address those risks as a matter of urgency. The standard was adopted by the ICPM in 2004 as a

supplement to international standard for phytosanitary measures (ISPM) number 11, [Pest Risk Analysis for Quarantine Pests](#). It provides guidance on the determination of the pest risk potential presented by living modified organisms and additional consideration for the pest risk analysis process for LMOs determined to present a potential pest risk.

IPPC entered into a cooperation agreement with the Convention on Biological Diversity in 2003. The objective of the cooperation agreement is to ensure active collaboration on issues of overlapping interest (e.g., addressing invasive species and establishing international risk assessment guidance on phytosanitary controls for LMOs) and to avoid duplication.

CODEX

The Codex Alimentarius Commission is a joint FAO/WHO body responsible for developing a code of global food safety standards, guidelines, and codes of practice. Over 170 countries are members of the Codex Commission. Biotechnology issues are under discussion in two committees, the Codex Committee on Food Labeling and the ad hoc Intergovernmental Task Force on Foods Derived from Biotechnology. The safety of foods derived from biotechnology has also been examined in a number of FAO/WHO Expert Consultations. In FAO's Medium Term Plan for 2006-2011, strong emphasis is placed on food safety assessments of foods derived from biotechnology in support of the Codex work.

The Codex Ad Hoc Intergovernmental Task Force on Foods Derived from Biotechnology was established by the 23rd session of Codex Commission in 1999. The Task Force completed its initial assignment in 2003 with the finalization of three texts: [Draft Principles for the Risk Analysis of Foods Derived from Modern Biotechnology](#) (CAC/GL 44-2003), [Draft Guideline for the Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Plants](#) (CAC/GL 45-2003), and [Draft Guidelines for the Conduct of Food Safety Assessment and Recombinant-DNA Microorganisms](#) (CAC/GL 46-2003). Taken together, these documents represent a remarkable global consensus on science-based risk assessment principles for foods derived from biotechnology. The Codex Commission agreed in 2004 to renew the Task Force until 2009. At the [September 2005 meeting](#), the Task Force agreed to undertake two new projects. The first is to develop a guideline for food safety assessments of recombinant DNA animals. The second is a project on food safety assessment of foods derived from recombinant-DNA plants modified for nutritional or health benefits. Some members of the Task Force expressed a desire to continue discussion of low-level presence of unauthorized recombinant DNA in plant materials at a future session.

Codex relies on joint FAO/WHO expert consultations to provide the scientific foundations for much of its work. Joint expert consultations have been particularly important to the success of the Ad Hoc Intergovernmental Task Force on Foods Derived from Biotechnology. The first joint FAO/WHO expert consultation on biotechnology and food safety was held in 1990. This first expert consultation was notable for developing the concept of substantial equivalence, which was subsequently elaborated by the OECD. A second expert consultation in 1996, entitled [Biotechnology and Food Safety](#), reaffirmed the conclusions of the 1990 consultation on the use of substantial equivalence. It also made specific recommendations concerning allergenicity. Three further joint FAO/WHO expert consultations have addressed [Safety Aspects of Genetically Modified Foods of Plant Origin](#) (2000), [Evaluation of Allergenicity of Genetically Modified Foods](#) (2001), and [Safety Assessment of Foods Derived from Genetically Modified Animals including Fish](#) (2003).

In 1991 the Codex Committee on Food Labeling was given a mandate "to provide guidance on how the fact that a food [is] derived from 'modern biotechnologies' could be made known to the consumers." The Codex Executive Committee approved the elaboration of guidelines in 1995 subject to the recommendation that "the Statements of Principle Concerning the Role

of Science should be closely adhered to and that the recommendations of the Joint FAO/WHO Expert Consultation on Food Safety and Biotechnology should be taken into account." The first draft of the labeling guidelines was circulated to members for comment in 1997. The Committee has been unable to reach an agreement on labeling guidelines. The Committee participants are divided over whether mandatory labeling should apply only in cases where significant changes in the product composition, characteristic, nutritional value or end use exist, or whether mandatory labeling should apply to all food products derived from biotechnology. The United States supports the former position. At the latest meeting in May 2005, the United States, joined by Mexico and Argentina, objected to further discussion on the labeling guidelines because consensus seemed to be hopelessly blocked. Nevertheless, the Committee agreed to continue its work. More progress has been made on a set of definitions pertaining to foods derived through biotechnology, but further discussion has been suspended pending progress on the guidelines.

ITPGRFA

The [International Treaty on Plant Genetic Resources for Food and Agriculture](#) (ITPGRFA), which was completed in 2001, seeks to promote the conservation and sustainable use of genetic resources from a designated list of agricultural crops. To this end it calls for the establishment of a multilateral system for access and benefit sharing for the genetic resources of the covered crops. The key component of this system, a multilateral transfer agreement (MTA), is still under negotiation. The MTA will set conditions for access to publicly-held genetic resources and establish a formula for royalty payments on new commercial varieties derived from those genetic resources. Because the genetic resources covered by the ITPGRFA are the raw material for genetic engineering of many important agricultural crops (soybeans being one important exclusion), access to those materials is important to researchers and plant breeders from both the public sector and the commercial sector. Successful implementation of the treaty would help provide protection against overly burdensome restrictions being imposed by the Convention on Biological Diversity (CBD).

Code of Conduct for Biotechnology

In 1989, the Commission on Genetic Resources for Food and Agriculture requested the FAO Secretariat to prepare a Code of Conduct for Biotechnology as it affects the conservation and use of plant genetic resources. A preliminary draft of an [International Code of Conduct on Biotechnology as it affects the Conservation and Sustainable Utilization of Plant Genetic Resources](#) was presented to the Commission in 1993. The objectives of the Code of Conduct, as originally agreed, should be to maximize the positive effects of biotechnology and minimize any potential negative effects, especially in developing countries. The draft Code of Conduct is voluntary. It calls on governments to "promote the transfer and development of appropriate biotechnologies." Governments are also urged to support research and promote international cooperation. To prevent and mitigate possible negative effects, governments are called on to monitor and assess socio-economic impacts, long-term environmental impacts, and possible negative effects on genetic diversity. The draft also covers access and benefits sharing and intellectual property protection. A component of the draft Code on biosafety and other environmental concerns was forwarded to the CBD in 1993 as a contribution to the work on the biosafety protocol.

Further work on the Code of Conduct was then suspended in 1995 pending the completion of the negotiations for the International Treaty on Plant Genetic Resources for Food and Agriculture. Following the completion of the negotiations on the International Treaty in 2001, the Commission asked the FAO Secretariat to prepare a study on the gaps and duplications in the international policy framework for biotechnologies for food and agriculture. This study, [Policy Issues, Gaps and Duplications](#), was presented to the

Commission in 2004. It concluded "there are no international policy instruments dealing with the issue of how agricultural biotechnologies might be focused on poverty reduction and food security." Among the 14 areas identified for possible further action were conservation of genetic resources, appropriateness of technologies, access and benefit sharing, centers of diversity/origin, ethical questions, genetic use restriction technologies, economic concentration in the agro-food system, and liability for gene flow. The Commission will consider what, if any, further action to take on these issues at its next session in 2006. Options include continuing work on the Code of Conduct or, alternatively, developing guidelines. If further work is agreed, the Commission will also have to decide whether to expand the scope to include livestock, fish and microorganisms.

Fisheries

The FAO [Code of Conduct for Responsible Fisheries](#), which was adopted in 1995, calls on countries to "minimize the harmful effects of introducing non-native species or genetically altered stocks used for aquaculture...into waters, especially where there is a significant potential for the spread of such non-native species or genetically altered stocks into waters under the jurisdiction of other States as well as waters under the jurisdiction of the State of origin." To date, Codex has not undertaken work on risk assessments for genetically engineered fish, nor has FAO attempted to develop environmental risk assessment procedures and criteria.

Forestry

FAO to date has not attempted to develop risk assessment strategies or criteria specifically for trees. (The IPPC pest risk assessment guidelines for LMOs apply to trees the same as to any other genetically engineered plant.) However, the Forestry Department is planning a process of expert consultations that could form the basis for a conclusion about whether such work should be undertaken by FAO

Ethics

In 2000, FAO Director-General Jacques Diouf established a Panel of Eminent Experts on Ethics in Food and Agriculture. The Ethics Panel's terms of reference included promoting "an overall sense of international responsibility with regard to the development of necessary policies and instruments aimed at maximizing global benefits, while minimizing the risks, arising from the application of modern technologies to food and agriculture." The Panel of Eminent Experts has issued two reports, one following its meeting in [2000](#) and another following its meeting in [2003](#), both of which contain substantial sections on biotechnology. In 2001, FAO published a paper, [Genetically Modified Organisms, Consumers, Food Safety and the Environment](#), as part of the FAO Ethics Series. This paper was considered as background material by the first meeting of the Panel of Eminent Experts. A paper prepared by a consultant for the second meeting of the Panel of Eminent Experts, [Law and Biotechnology: Selected Issues of Relevance to Food and Agriculture](#), was published in 2003 as part of the FAO Legislative Studies Series.

The body of FAO work on ethics addresses biotechnology principally from two perspectives, both based in international human rights law. The first is public participation in the risk management process. The second is the right of developing countries to share in the benefits of biotechnology. Without demonstrating much evidence of thoughtful deliberation, the Panel of Eminent Experts stakes out a clear position on one side of the global debate over biotechnology. It embraces the precautionary principle, traceability, labeling, socio-economic concerns, and anti-intellectual property rhetoric as "ethical" approaches to managing the risks of biotechnology and ensuring the benefits are available to developing countries.

V. Capacity Building and Technical Assistance

FAO provides capacity building and technical assistance upon request to developing countries. Activities related to biotechnology have focused on regulatory capacity building for biosafety and capacity development in plant breeding and modern biotechnology. In recent years, requests for assistance have primarily been in the area of biosafety capacity building. The entry into force of the Cartagena Protocol has undoubtedly been a strong influence on this trend.

Biosafety Capacity Building

Assistance programs have been focused on building and enhancing the institutional and legislative frameworks to enable countries to carry out biosafety regulatory functions. Projects have been completed in Argentina, Bolivia, Paraguay, Bangladesh and Malaysia. In the pipeline are projects for Kenya, Swaziland, Benin, Burkina Faso, Tanzania, Uganda, and Sri Lanka.

FAO maintains a [biosafety library](#) on its website containing guidelines, manuals, reports and toolkits. These resources are intended as reference materials for capacity-building efforts.

Research and Development Capacity Building

The joint FAO/IAEA Agriculture and Biotechnology Laboratory, located in Vienna, provides research, training, and analytical support to developing countries. The laboratory uses biotechnology to develop new plant breeding lines, usually in cooperation with national plant breeding programs. In recent years it has developed a new drought-resistant wheat variety for use in China, drought-resistant chick peas for South Africa, and three new sesame varieties for Egypt. The laboratory also provides training programs in DNA marker techniques and marker-assisted selection.

FAO is undertaking a [global survey](#) of plant breeding capacity, including the extent of application of biotechnology, with the aim of developing and maintaining an up-to-date database on national plant breeding programs. To date, about 27 countries from Africa, Asia, Latin America, the Near East and Europe have responded to the survey. The results show, *inter alia*, that biotechnology is not sufficiently integrated into practical plant breeding activities in developing countries, mostly due to inadequate resources and a lack of trained staff. To address this problem FAO has supported training courses in collaboration with the CGIAR centers and national research institutes.

VI. Information Sharing

FAO has been very active in disseminating information and serving as a forum for international discussion on biotechnology issues. It views its role as serving members' needs for information on "which biotechnologies are available, what they can be used for, how and in which wider strategy they can be applied, and what the cost-benefit implications of using them are." It sees itself as a broker of objective, unbiased information. Some of the more important information-sharing activities are described below.

Electronic Forum on Biotechnology in Food and Agriculture

The [Electronic Forum on Biotechnology in Food and Agriculture](#) was launched in 2000. It is a series of moderated e-mail conferences allowing wide-ranging participation by governments, NGOs, and private parties. Background and summary documents are available for each

topic. To date there have been 13 conferences covering topics such as IPRs, gene flow, marker assisted selection, and food processing. The report, [Agricultural Biotechnology for Developing Countries - Results of an Electronic Forum](#), summarizes the first six conferences.

BioDeC Database

[BioDeC](#) is a searchable database designed to provide an inventory of biotechnology products in use or in the pipeline in developing countries. The database, which was launched in April 2004, contains information from 70 countries on the following 11 subjects: biotechnology research policy; research capacity (key institutions; summary of major research programs); biotechnology regulatory framework (biosafety; food safety; patents; plant variety protection; plant genetic resources; animal genetic resources); biotechnology applications; and publications and links. Only descriptive information is included in the database; it does not include quantitative information such as commercial production levels or spending on research. Individual country information is divided into two categories: genetically engineered products and other biotechnologies (e.g., molecular markers, diagnostics). The database also reports the status of biotechnology applications in three categories: research phase, field trials, and commercialization. In 2005 FAO published a summary and analysis of the information contained in BioDeC in the form of a report titled [Status of Research and Application of Crop Biotechnologies in Developing Countries](#).

International Networks

REDBIO: In 1991 the FAO Regional Office for Latin America and the Caribbean established the Technical Cooperation Network on Plant Biotechnology ([REDBIO](#)). The network links over 600 laboratories and institutions in Latin America and the Caribbean. The objective of REDBIO is "to accelerate the process of adaptation, generation, transfer and application of plant biotechnology to contribute to the solution of crop production constraints and genetic resources conservation for the countries of the Region." Specifically, REDBIO serves as a forum for policy support, technical assistance, training, cooperative research activities, and information sharing. REDBIO is an example of the benefits of human and institutional capacity building. Not only are scientists in the region developing their own solutions to the agricultural productivity challenges in the region, they are becoming more engaged in the public debate on biotechnology. In two statements ([Declaration of Goiania, REDBIO 2001](#), and [Declaración de Boca Chica, REDBIO 2004](#)) the members of REDBIO have declared biotechnology indispensable to meeting the food security needs of the region through sustainable agriculture.

Asian Bio-Net: The [Asian Bio-Net](#) was launched in 2002 with funding from the government of Japan. It is based at the FAO regional office in Bangkok. Participants include Bangladesh, China, India, Indonesia, Malaysia, Pakistan, the Philippines, Sri Lanka, Thailand and Vietnam. The project serves as a means for organizing regional consultations, facilitating technical cooperation, and building biosafety capacity for genetically engineered crops. One of the overarching objectives of the project is regional regulatory harmonization. Focal points from each participating country meet annually. Activities under the project include training workshops, the publication of a [risk communication manual](#), and the preparation of a [benchmark study](#) on the status of biosafety capacity in each country.

ABNETA: FAO is developing a regional biotechnology network for Africa based on the Latin American and Asian models. ABNETA will have two regional hubs, one for Southern and Eastern Africa and one for Western and Central Africa.

Publications

In the last ten years FAO has published a substantial number of books and documents on the subject of biotechnology. Many of these are available on its website (<http://www.fao.org/biotech/doc.asp>). In 2004, FAO's report on the [State of Food and Agriculture 2003-2004](#) was dedicated to the question of the role of agricultural biotechnology in meeting the needs of the poor. The report was widely viewed as a positive contribution to the global debate on biotechnology. Other noteworthy publications include [Glossary of Biotechnology for Food and Agriculture](#) and [Law and modern biotechnology: Selected issues of relevance to food and agriculture](#).