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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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REPORT FROM FAO ON ITS POLICIES, PROGRAMMES AND ACTIVITIES ON AGRICULTURAL BIOLOGICAL DIVERSITY: (2) CROSS-SECTORIAL MATTERS

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REPORT FROM FAO ON ITS POLICIES, PROGRAMMES AND ACTIVITIES ON AGRICULTURAL BIOLOGICAL DIVERSITY: (2) CROSS-SECTORIAL MATTERS

I. INTRODUCTION

1. The Commission regularly receives reports from international organizations, including FAO, on their policies, programmes and activities for the conservation and use of plant and animal genetic resources. The Commission considers such reports to be of value, both for it and for the organizations, which are able to acquaint countries with their objectives and programmes, and benefit from their comments.

2. This report provides information on a wide range of FAO's activities of a cross-sectorial nature, of relevance in the light of the Commission's broadened mandate. Sectorial activities are addressed in document CGRFA-9/02/14.1. Information on the relevant Priority Areas for Inter-disciplinary Action (PAIA) is in document CGRFA-9/02/14.3. Reports submitted by other organizations are in document CGRFA-9/02/15.1, CGRFA-9/02/15.2 and CGRFA-9/02/15.3.

II. FAO ACTIVITIES IN 2000, 2001 AND 2002

1. Sustainable development and genetic resources

3. The Sustainable Development Department has developed and implemented a number of activities related to the conservation and sustainable utilization of genetic resources for food and agriculture, which also take into consideration gender issues.

4. The FAO focal point on biological diversity for food and agriculture is the Research, Extension and Training Division (SDR). An Inter-departmental Working Group on Biological Diversity for Food and Agriculture was revitalized in July 1997. This Working Group facilitates a coordinated approach to FAO's contribution, implementation and follow-up on the recommendations of the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD), and its Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA). In accordance with the Memorandum of Cooperation for a Joint Programme of Work, signed by the CBD Secretariat and FAO in September 1997, an FAO Programme Officer on Agricultural Biodiversity is seconded to the CBD Secretariat.

5. A number of decisions of the Conference of the Parties to the CBD are of relevance to FAO, in particular decisions III/11; IV/6; and V/5, which recognize the leading role of FAO in agricultural biological diversity and refer to FAO's coordinating role for, *inter alia,* the International Pollinator Initiative; and, more recently, decision VI/5, inviting FAO to facilitate and coordinate the International Initiative for the Conservation and Sustainable Use of Soil Biodiversity, and welcoming the process initiated by FAO for the preparation of the first *Report on the State of the World's Animal Genetic Resources*. Decision VI/5 also invites FAO to participate in the further study of the impacts of trade liberalization on agricultural biodiversity. FAO, with its multidisciplinary expertise, is increasingly asked to contribute to the implementation of the CBD in the area of biological diversity for food and agriculture at the ecosystem level, complementing and integrating activities with work on genetic resources.

6. At the request of the COP, and in collaboration with the CBD Secretariat, FAO, through its Inter-Departmental Working Group on Biological Diversity for Food and Agriculture, carried out an assessment of ongoing activities in agricultural biodiversity. In the context of this assessment, a programme of work on agricultural biodiversity was developed and adopted by the COP at its fifth meeting in Nairobi in May 2000, as one of the three components of decision V/5, on agricultural biodiversity. The assessment applied an ecosystem approach, and involved consideration of different levels of agricultural biodiversity (ecosystems, species and genetic levels) and integrated socio-economic dimensions. The priority elements of the programme of work on agricultural biodiversity are assessment, adaptive management, capacity-building and mainstreaming. The CBD Secretariat extended an invitation to FAO to support the implementation of the decision, including through facilitation and coordination of the International Initiative for the Conservation and Sustainable Use of Pollinators. FAO has also been invited to contribute to work related to a wide range of other decisions, including, for example, on forest biological diversity, marine and coastal biodiversity, and alien species.

7. Two meetings of the CBD liaison group on agricultural biodiversity were organized by the FAO and the CBD secretariats in cooperation. The first liaison group meeting on agricultural biodiversity was organized in September 1999 (Rome) to discuss the proposed elements of a programme of work on Agricultural Biodiversity. As the COP invited a number of organizations to support development and implementation of Decision V/5, a second liaison group meeting on agricultural biodiversity was held in Rome, in January 2001.

8. The Inter-Departmental Working Group on Biological Diversity for Food and Agriculture has developed a PAIA on the integrated management of biological diversity for food and agriculture, which will contribute to the further understanding of the functions of agricultural biodiversity in agricultural ecosystems, and hence will promote the ecosystem approach for the management of production systems. The PAIA became operational in January 2002.

9. The Working Group on Biological Diversity for Food and Agriculture prepared a background paper on agricultural biodiversity for the Maastricht Conference on the Multi-functional Character of Agriculture and Land in 1999, where, *inter alia,* the underlying causes of agricultural biodiversity losses and options for sustaining agricultural biodiversity were discussed.

10. Organic agriculture is based on spatial and temporal biodiversity management. Organic management aims to enhance soil biodiversity, to diversify on-farm plants and animals, to regenerate/conserve indigenous races/breeds and to create an agro-ecosystem suitable for wildlife. The Environment and Natural Resources Service (SDRN) is now in the process of documenting, through case studies in different geographic areas and for different agroecological zones, the linkages between organic agriculture and the conservation and sustainable use of biological diversity, including the use and importance of traditional knowledge of indigenous species.

11. SDRN continues to host the Secretariat for the Global Terrestrial Observing System (GTOS), which was launched in January 1996 to address data and information needs related to global and regional change in the areas of land quality, freshwater resources, biodiversity, climate change, and pollution and toxics. GTOS has recently completed a major overhaul of the Terrestrial Ecosystem Monitoring Sites (TEMS) meta-database, which contains information on 1 200 ecological monitoring sites around the world that carry out long-term monitoring activities. Users can search for sites that measure any of 110 variables (biological, physical and chemical), and the system is able to generate sites in specific ecological regions. Links are provided to complementary satellite measurements as well as to more than 60 socio-economic databases. GTOS is also leading the development and implementation of the Terrestrial Carbon Observation (TCO) initiative, which is aimed at developing more accurate data and information about terrestrial carbon stocks and fluxes.

12. FAO is one of the co-sponsoring organizations for the Millennium Ecosystem Assessment programme (MA), which was jointly initiated by the UNEP, the World Bank and the World Resources Institute. The MA is aimed at providing policymakers with "state-of-the-art" scientific information on conditions, future scenarios and response options related to the goods and services provided by the world's ecosystems - mainly agriculture, grasslands, forests, freshwater and coastal ecosystems. It will also help in building capacity at all levels to undertake integrated ecosystem assessments and to act on their findings. FAO participated in, and contributed to, the process of the MA through the membership of the Chief, Environment and Natural Resources Service (SDRN) on the MA Steering Committee, and the participation in the first MA technical design workshop of experts from both the Forest Conservation, Research and Education Service (FORC) and the Land and Plant Nutrition Management Service (AGLL).

13. The FAO Council and subsequently the Conference, discussed and approved a new programme of work for FAO on biotechnology, and, as a consequence, an Inter-departmental Working Group on Biotechnology was created. The Working Group launched a website on biotechnology, which provides information in five languages (Arabic, Chinese, English, French and Spanish); and FAO-BiotechNews, an English-language list, with a continuously increasing number of subscribers (currently about 2 250).

14. The Research and Technology Development Service (SDRR) participated and made presentations in several technical meetings on biotechnology and biosafety issues. These presentations generally emphasized the prospective contributions of biotechnology to the conservation and utilization of genetic resources, as well as the need for the development of safety regulations at national and regional levels. A workshop was organized by SDRR, together with ICARDA, to foster the development and the harmonization of biosafety regulations for ten countries in the Near East region. A training course for potential National Biosafety Focal Points of the same region is currently in preparation.

15. SDRR coordinated the publication of a revised and extended edition of the *Glossary of Biotechnology for Food and Agriculture* which provides information on about 3 200 biotechnology terms and acronyms used in biotechnology, and their application to food and agriculture (including agriculture, forestry and fisheries). It specifically covers the following themes: tissue culture techniques, genetics, molecular biology, animal reproduction technologies, and immunology.

16. Surveys of the current state of biotechnology in Sub-Saharan Africa and in Eastern Europe were conducted by SDRR and will be utilized as the basis to provide further assistance to countries of these regions. An inventory of biotechnologies in use or in the pipeline in developing countries has been compiled. The inventory, whose finalization is under way, will provide necessary information to identify needs, priorities and opportunities to improve the application of biotechnology, and will form the basis for the building-up of a Database on Biotechnology in Developing Countries.

17. An *Electronic Forum on Policy Issues related to Biotechnology and its Products* has been established, as a cross-departmental tool under the leadership of SDRR. Seven email conferences were conducted, in which themes relevant to the possible impacts of biotechnology on agriculture, forestry and fisheries sectors, and on food security in developing countries, as well as the impact of intellectual property rights were discussed. The seventh conference was focused on the potential importance and impact of gene flow from genetically modified to non-genetically modified populations, very relevant to the conservation and utilization of genetic resources. Approximately 1 500 people from all over the world registered with this Forum. Many messages were related to matters of relevance to the conservation and utilization of genetic resources.

18. Requests for assistance in the development and implementation of regulations and capacity-building related to risk assessments of genetically modified organisms were received from a number of countries. They are under discussion and elaboration by SDRR, in consultation with the Technical Cooperation Department (TC). A request for assistance in the strengthening of the National Biosafety System has been received from Paraguay, and is being addressed through a Technical Cooperation Project, currently under implementation.

19. The Gender and Development Service(SDWW) deals, among other issues, with the inter-relationships between local knowledge systems, management of agrobiodiversity and gender aspects. Within the context of the regional project, "Gender, Biodiversity and Local Knowledge Systems to Strengthen Agricultural and Rural Development" training, small grants and technical backstopping to raise awareness and build capacity in the use and value of local knowledge (women's and men's) for food security, have been provided in Mozambique, Swaziland, Tanzania and Zimbabwe.

2. Economic and social questions

20. The Economic and Social Department (ES) is developing a programme of work on the economics of agro-biological diversity, in cooperation with technical units, with the overall objective of providing policy-makers and policy-analysts with the information and tools necessary for achieving the conservation and sustainable utilization of genetic resources in agriculture. A primary objective of the programme is the provision of practical policy guidance on implementing relevant multilateral agreements, such as the International Treaty on Plant Genetic Resources for Food and Agriculture and the Convention on Biological Diversity, with the inclusion of food security objectives. The activities of the Department to meet these objectives include commissioning studies to fill information gaps, development of methodologies for impact assessment and policy guidance, publishing and disseminating results from existing studies, provision of technical assistance to inter-departmental and inter-agency working groups, and participating in policy-makers' workshops.

21. A major portion of the work being conducted under the programme element, *Economics of natural resources and environmental sustainability*, is focussed on analysing issues affecting the access to, and the benefits farmers obtain from, genetic resources in agricultural production, and how these can be enhanced, particularly for the poor. Under the FAO Netherlands Partnership Programme (FNPP/GLO/002/NET), a programme of work on the relationship between seed system management and on-farm utilization of plant genetic resources and farmers' welfare was launched in 2001, involving collaboration between the Economic and Social (ES), Agriculture (AG), and Sustainable Development (SD) Departments, and the Legal Office (LEG). The expected outcome of this work is guidelines for policy-makers and planners on improving the management of seed systems, to obtain both improvements in farmers' welfare, and sustainable utilization of plant genetic resources. Fieldwork is being undertaken in Ethiopia and Bolivia in 2002, the results of which will be disseminated through publications and workshops. Under this same programme, the farm-level determinants of agricultural biodiversity utilization and conservation are being investigated, in partnership with several of the CGIAR centers, including IPGRI, IFPRI, ILRI and CIP. Here the focus is on providing information about the constraints that farmers face in selecting a portfolio of genetic resources for agricultural production, and how these vary with differing socio-economic and environmental conditions. A third portion of the work under the project is analysis of the ways in which national level seed regulations can be improved, to provide greater access to plant genetic resources among poor populations. This work is being conducted under contract with ICRISAT.

22. FAO has commissioned sixteen chapters for a book that will be published in 2002, on various aspects of economic analysis of agricultural biodiversity and biotechnology. The issues being addressed include: valuation of biodiversity, intellectual property rights and impacts on agricultural biodiversity, the potential impacts of biotechnology development on biodiversity

conservation, and policies to promote the conservation and sustainable utilization of genetic resources. The book will summarize the state of the art in economic analysis of agricultural biodiversity and biotechnology management, as well as provide a unique perspective on the linkages between the two.

23. The Economic and Social Department participated on the inter-departmental taskforce responsible for managing the study of the potential impacts of Genetic Use Restriction Technologies (GURTs). This has resulted in the production of the document*: Potential Impacts of GURTs on Agricultural Biodiversity and Agricultural Production System*s (CGRFA/WG-PGR/01/7), which was presented at the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture at FAO, in July 2001, and, after revision, as document CGRFA-9/02/17. The ES Department oversaw the production of the chapter focussed on the potential economic impacts of this technology. In addition, a study on the impacts of adopting various types of intellectual property right regimes for plant genetic resources (*e.g.*, patents, *sui generis*) on seed industry performance is currently being undertaken. This study is expected to be completed in 2002.

24. Under the FNPP programme (FNPP/GLO/002/NET), the ES and AG Departments have commissioned ICRISAT to develop an economic model that can be used for analysing the impacts of trade liberalization on seed markets and agricultural biodiversity. Empirical information from a case study in South Africa will be used to calibrate this model, which is expected to be completed by 2003. In addition, the ES department made substantial contributions to the draft paper entitled *Assessing the impact of trade liberalization on the conservation and sustainable use of agricultural biodiversity*, which has been produced by the Convention on Biological Diversity in 2002, and is currently undergoing peer review. *Table 1* lists publications and workshops that are under preparation by the ES Department related to agro-biodiversity.

Table 1: Publications and workshops related to agricultural biodiversity under preparation by the Economic and Social Department

Title	*Content/Format*	*Expected Date*
Biotechnology, Biodiversity and Development	Twenty-chapter book, jointly published by FAO and external publisher	October 2002
Farm Level Determinants of Crop Genetic Diversity: Empirical Evidence from Peru and Ethiopia	ES Development Paper Series Publication	December 2002
The Impact of Seed System Management on Farmer Benefits and Agricultural Biodiversity: Lessons from the Field	ES Development Paper Series Publication	April 2003

3. Integrated Pest Management Activities

25. Outputs from the Integrated Pest Management (IPM) Programme over the past 20 years contribute to outcomes by partners in several ways: practical assessments of biodiversity at genetic, species, and ecosystem levels; case-studies of adaptive management by small-scale farmers of that biodiversity; and local capacity-building, such as through Farmer Field Schools, which have been undertaken in over 100,000 local communities. These outcomes all contribute to the long-term objective of mainstreaming agro-biodiversity, through ecologically-based IPM, in national policies and programmes in more than 40 member countries.

26. FAO's strategy is to facilitate national and local IPM approaches through community-based, non-formal adult education, whereby farmers assess in their own fields functional groups of species that provide ecosystem functions like predation, parasitization, and competition, in relation to the genetic diversity of crops in food webs. Using the same food web concepts, farmers in FAO-associated programmes explore how nutrient cycles, starting with decomposer bacteria and fungi in the soils of flooded rice ecosystems, link to food chains comprised of aquatic filter feeders and predators in the water and on the water surface. These predators then provide the essential service of pest-control, by occupying rice plants and defending fields, before rice-feeding pests even arrive. These same farmers assess the contributions from species shared with nearby uncultivated or abandoned aquatic ecosystems to rice agro-ecosystem functions. In this way, the practical necessity of conservation of functional groups of species in an ecosystem context is demonstrated by the farmers, and supports their management decisions.

27. A number of case studies of good adaptive management have emerged from FAO's IPM programme demonstrating the potential of the ecosystem approach in rice-, field legume-, vegetable-, potato-, and cotton-based agro-ecosystems in several countries, including Indonesia, China, Philippines, Vietnam, Cambodia, Thailand, the People's Democratic Republic of Lao, India, Sri Lanka, Bangladesh, Pakistan, Mali, Zimbabwe, and Ecuador. The case studies have been made available in presentations with the People, Land Management and Environmental Change project (PLEC), in publications from the International Institute for Environments and Development (IIED), on the Community IPM website,[1] and in a recent FAO publication from the Regional Office in Bangkok. In collaboration with CIP, CARE, IRRI, the Vietnamese Institute of Agricultural Genetics, Peruvian national programmes, and local NGOs, FAO's IPM programmes have explored deployment of within species, gene-level biodiversity for adaptively managing major global plant diseases like rice blast in Vietnam, and potato late blight in Peru. With SEARICE and IPGRI, these IPM programmes now support the expansion of Farmer Field School methodologies to the community level, and *in situ* conservation and utilization of intra-specific genetic resources in Indonesia, Cambodia, Philippines, and Mali.

28. The primary outcome of FAO's IPM programmes has been local capacity-building in assessing and adaptively managing agro-biodiversity. For example, each week in the rice growing season, groups of farmers in the Farmer Field School carry out an "agro-ecosystem analysis" as the basis of their crop-management decisions. This way, farmers are empowered to better manage their agro-ecosystems, increasing production while substantially reducing pesticide pollution. FAO's IPM programmes now have supported farmers growing rice, vegetables, and cotton in Asia; cotton, maize, beans, rice, tomatoes, haricots-verts, cowpeas, groundnuts, and paprika in Africa; potato, cotton, and vegetables in South America; and rice, citrus, pistachio, and glasshouse crops in the Near East. Beyond the more than two million farmers who have participated in Farmer Field Schools, are the operational networks of farmer trainers, local IPM clubs, farmers' organizations that market pesticide-free produce, and partnerships between farmers' groups and researchers.

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[1] http://www.communityipm.org

29. IPM initiatives grow into constituencies that work for policy reform, explicitly building on ecosystem approaches to crop and pest management that are based on ecological services, delivered at the gene (durable host-plant resistance and varietal deployment), species (conservation of predator species), and ecosystem (dynamics of food webs across cultivated landscapes) levels. Significant policy reforms, such as eliminating hundreds of millions of dollars in pesticide subsidies, re-allocating money saved to ecosystem-approaches in farmers' education, and banning pesticides that destroy local populations of crucial species have taken place in India, Indonesia, Vietnam, and Philippines. Subregional economic organizations such as the Association of South East Asian Nations (ASEAN) and the Southern African Development Co-ordination Conference (SADCC) are harmonizing standards on pest-control, and supporting IPM policies among their member countries.

4. Information and communication activities

30. The Information Division (GIID) produces and disseminates a range of information materials of relevance to genetic resources for food and agriculture to a worldwide audience. Recent activities have included:

- Release of an FAO statement on biotechnologies, widely disseminated to the print press, and through radio interviews, and video news releases.
- A seminar/briefing on bioethics in food and agriculture for journalists, followed the first meeting of the Panel of Eminent Experts on Ethics in Food and Agriculture (26-28 September 2000), which provided an excellent opportunity for media representatives to learn more from FAO experts on biotechnologies and their potential impacts.
- The first two papers in the FAO Ethics Series: *Ethical issues in food and agriculture* and *Genetically modified organisms, consumers, food safety and the environment*, as well as the *Report of the First Session of the Panel of Eminent Experts on Ethics in Food and Agriculture*.
- The World Watch List for Domestic Animal Diversity, third edition, announced on 5 December 2000 with a media briefing at headquarters, issuing a press release, a video news release, and many radio interviews, and a web story; there was very significant coverage around the world.
- Wide publicity for the adoption of the International Treaty on Plant Genetic Resources for Food and Agriculture by the FAO Conference, in November 2001. A Communication Strategy on the Treaty was prepared, in collaboration with the Secretariat of the Commission on Genetic Resources for Food and Agriculture, including the production of a video in official languages, presenting the main issues in a regional context.

5. Legal activities

31. The Legal Office, through the Regular and Field Programmes, provides technical assistance, regionally and nationally, in the formulation of policies, strategies and legislation in the field of genetic resources for food and agriculture and related matters.

32. During 2001, the Legal Office assisted the Government of Syria in drafting legislation to strengthen plant genetic resources conservation and sustainable use. The legislation also covered the rights of farmers and local communities, as well as access and benefit-sharing. It is the first legislation to be drafted in line with the International Treaty on Plant Genetic Resources for Food and Agriculture.

33. In 2002, legislation for Oman was also prepared in order to update the legislative and regulatory regime governing citrus plant material. During the second half of 2002, a TCP project will be implemented in the Democratic People's Republic of Korea to establish a modern seed inspection system, including the review and updating of seed legislation, regulations and standards.

34. In 2002, several initiatives on plant genetic resources were undertaken. The International Treaty on Plant Genetic Resources for Food and Agriculture was published as an FAO Legal Paper Online. A recent legal study on *Intellectual property rights in plant varieties: an overview with options for national governments* reviews and assesses existing international legal regimes relating to intellectual property rights in plant genetic resources, with a specific focus on agricultural plant varieties. The legal study, *Regulating access to germplasm: a comparative study of the role and implementation of seed laws and plant variety protection*, will be ready for publication in the second half of 2002. This study describes the role of seed and plant variety protection legislation, and provides for approaches on how to design and implement seed laws and plant variety protection. A document that includes proposals and strategies for the *Harmonization of seed legislation in West and Central Africa* was prepared by the Legal Office under an FAO Government Cooperative Programme project funded by France during 2001-2002.

35. The Legal Office has improved, FAOLEX, its comprehensive computerized legislative database. Selected texts pertaining to FAO's mandate, including plant genetic resources, seeds and plant variety protection have been included, and summarized.

36. The Legal Office has been involved over the last two years with inter-departmental work as part of the Priority Areas for Interdisciplinary Action (PAIA) on biotechnology and biosecurity. Activities will continue over the next two years and include, an integrated programme to build capacity for biotechnology, food quality and safety and zoosanitary standards. This programme will finance the development of regional and national capacity building on regulatory and legal aspects of biotechnology in food and agriculture.

37. As part of its departmental work, the Legal Office will participate in 2002 in an Expert Consultation to improve understanding of the nature and relevance of biosecurity for food and agriculture, and to devise ways to implement biosecurity measures at national and international levels. The Legal Office is preparing a background document for this Expert Consultation, which will provide an analysis of existing international and regional regulatory instruments relevant to all aspects of biosecurity, as well as identify the potential for synergy and harmonization between different fields.

38. The Legal Office has participated actively in the organization of a number of workshops on the implementation of the Code of Conduct for Responsible Fisheries. In addition, through TCP projects, it contributes to the implementation of basic principles provided for in the Code at national legislation level.

39. The Legal Office follows carefully the activities deployed by the Animal Genetic Resources Group, AGAP in the development of regulatory instruments for animal genetic resources management.

III GUIDANCE REQUESTED FROM THE COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

40. The Commission may wish to express its views and make suggestions on the policies and activities covered in this document, so that the relevant technical groups can take these into consideration when carrying out their specific tasks, and when planning for the future.