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Item 8 of the Draft Provisional Agenda

COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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REPORTS FROM FAO ON ITS POLICIES, PROGRAMMES, AND ACTIVITIES ON AGRICULTURAL BIOLOGICAL DIVERSITY:

(1) SECTORIAL MATTERS

TABLE OF CONTENTS

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REPORTS FROM FAO ON ITS POLICIES, PROGRAMMES, AND ACTIVITIES ON AGRICULTURAL BIOLOGICAL DIVERSITY: (1) SECTORIAL MATTERS

I. INTRODUCTION

1. The Commission on Genetic Resources for Food and Agriculture regularly receives reports from relevant international organizations, including FAO, on their policies, programmes and activities of relevance to the conservation and sustainable use of genetic resources for food and agriculture. These reports contribute to understanding in this area between FAO and its Commission, and other international organizations, and to their further cooperation and coordination of their work.

2. This report provides information on the wide range of FAO's activities relevant to the conservation and sustainable use of all genetic resources for food and agriculture, including crops and forages, farm animals, forestry, fishery, invertebrates and micro-organisms. Cross-sectorial activities are covered in document CGRFA-11/07/20.2. Information on the relevant Priority Areas for Inter-disciplinary Action (PAIAs) can be found in document CGRFA-11/07/20.3. An analysis of the human and financial resources available within the FAO, to support work on the various sectors of genetic resources for food and agriculture is given in the document CGRFA-11/07/22. Reports submitted by other organizations are in documents CGRFA-11/07/19.1, CGRFA-11/07/19.2 and CGRFA-11/07/19.3.

II. FAO ACTIVITIES SINCE NOVEMBER 2004

1. Crop and forage genetic resources

Conservation and sustainable use of plant genetic resources

3. *Crop and crop-associated biodiversity.* Through extra budgetary resources, FAO has coordinated the implementation of some activities under the National Agricultural Biodiversity Programme of Lao PDR, including the development of studies, training and curricula through collaboration with the Livelihoods Support Programme. Training sessions were also organized on plant genetic resources and seeds in Mali for several western African countries based on a document entitled "*Guide pratique pour les champs de diversité*".

4. FAO is contributing to the achievement of the *2010 Biodiversity Target of the Convention on Biological Biodiversity (CBD)* and in particular the GEF-funded *2010 Biodiversity Indicators Partnership project* and other related processes (e.g. Streamlining European 2010 Biodiversity Indicators). The Seed and Plant Genetic Resources Service (AGPS) is leading the development of global indicators on *trends in crop genetic diversity in ex-situ collections* and *area of agricultural ecosystems under sustainable management*. FAO also coordinates work on pollinators[1].

5. FAO is collaborating with Bioversity International (formerly the International Plant Genetic Resources Institute, IPGRI) in a United Nations Environment Programme (UNEP)/Global Environment Facility (GEF)-funded project aimed at the *effective in situ conservation and use of crop wild relatives through enhanced information management and field application* in Armenia, Bolivia, Madagascar, Sri Lanka and Uzbekistan".

[1] Refer paras. 48-53 below, and to information document CGRFA-11/07/Inf.15.

6. *Strengthening National Seed Systems and regulatory frameworks:* National or sub-national stand-alone or built-in seed programme development for production of high yielding varieties was carried out or is underway in Afghanistan, Cameroon, Libya, Myanmar, Sierra Leone, Nigeria, Venezuela and Tajikistan, while other projects are under development in Angola, Azerbaijan, Sudan and Lesotho. Community seed security projects are operating in Ethiopia, Honduras, Moldova and Malawi and support is provided to Lao PDR, Tanzania, Mozambique and Mali on on-farm management of plant genetic resources for food and agriculture (PGRFA) including seed. FAO conducted studies in Ethiopia on the role of local markets in exchange of crop diversity and an assessment tool is being developed with International Agricultural Research Centres (IARCs) for validation in selected African countries. National projects for developing access policy for seed and plant genetic resources (PGR), have been implemented in Angola, Burkina Faso, the Democratic Republic of Congo, The Gambia, Guinea, and Sierra Leone and a project has just been approved in Iran. FAO collaborated with the World Intellectual Property Organization (WIPO), for training courses on access and Intellectual Property Rights (IPRs) on Plant Genetic Resources and Biotechnology in India and Brazil in 2006. Seed quality assurance capacity of member countries are being strengthened through workshops jointly conducted by FAO and the International Seed Testing Association (ISTA) for member countries in all regions.

7. FAO is helping the African Union to formulate an Africa-wide seed and biotechnology programme for the development of efficient and integrated seed systems by strengthening continental, regional and national seed policies and developing capacity for germplasm conservation and all elements of seed program/industry, including diffusion of improved seed and formal/informal sectors linkage.

8. *Seed Relief and Rehabilitation:* In response to natural and man-made disasters, between 2004 and 2006, FAO has assisted in developing a strategy aimed at preparedness for, and effective and sustainable response to food and agricultural emergencies leading to the execution of 157 projects at a cost of US$ 107 million.

9. *Regional Seed Policy Harmonization:* FAO has supported the Southern African Development Community (SADC), the Economic and Monetary Union of West Africa (UEMOA) and the Economic Community of West African States (ECOWAS) to undertake harmonization of national seed regulatory frameworks in their respective Member States with subsequent development of a supportive legal framework for eventual adoption by these regional bodies. A similar exercise is on-going in the Central Asian countries[2] where a mechanism is being created for a regular sub-regional seed forum.

10. *Seeds and Biosafety:* Technical assistance was provided by FAO in partnership with other technical units, to strengthen national capacity and infrastructure of the regulatory agencies to effectively handle genetically modified (GM) plants and plant materials and provide greater technical and advisory assistance to their national biosafety policy and framework. Between 2004-5 biosafety projects were completed for Granada, Swaziland, Kenya and in the pipeline for Benin and Tanzania. Further sub-regional technical training courses on advanced methodologies for GM seed detection were organized in collaboration with ISTA for the Greater Mekong Subregion, the Central Asian region, Latin America and the Caribbean region.

11. *Capacity Building for enhanced use of PGRFA through plant breeding strategies and biotechnology:* An assessment of the plant breeding and related biotechnology capacity in member countries is being carried out by FAO to identify gaps and opportunities at national and regional levels. Information was gathered from 69 member countries and these assessments are providing a foundation for strategic advice and actions on how national governments and research and development community can redefine national plant breeding strategies and programs. Between 2004-5 a series of training workshops on modern techniques in plant breeding were organized with partners including with extra-budgetary funds. During the First

[2] Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkey, Turkmenistan and Uzbekistan.

Session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture, FAO and partners launched the *Global Initiative for Plant Breeding Capacity Building* (GIPB). The goal of this Initiative is to strengthen capacities of the developing countries and of those with economies in transition to improve sustainable use of PGRFA using better breeding and seed delivery systems. The use of biotechnology for plant breeding and related activities is being enhanced in the member countries through technical capacity building, policy assistance and strengthening of networks such as the Agricultural Technical Cooperation Biotechnology Network for Latin America (RedBio) and the Agricultural Biotechnology Network in Africa (ABNETA).

12. In collaboration with Bioversity International FAO is updating the 'Handbooks for Genebanks'–the standard reference for genebank operations published in the 1980s, with the latest available information from the domain of seed science and technology. The Manual has been tested and validated through a hands-on global validation workshop held in Turkey in March 2006 and the final version of the Manual is under publication.

13. FAO provides strategic support to a United Kingdom initiative implemented by the Royal Botanic Gardens Kew to improve the capacity of African genebanks and community seed banks to identify, handle and store crop species that present difficulties in their long-term conservation.

Technical Support to the International Treaty on Plant Genetic Resources for Food and Agriculture

14. FAO has strongly promoted the International Treaty through lectures and training courses in more than 20 countries,[3] and has continued providing technical support to its Commission on Genetic Resources for Food and Agriculture.

15. FAO, in collaboration with Bioversity International, has continued applying the new approach for monitoring the implementation of the *Global Plan of Action for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture*. Since 2002, countries have established or are finalizing their national information sharing mechanisms, and have developed their country reports that will contribute to the preparation of the *Second State of the World's Plant Genetic Resources for Food and Agriculture*.

16. FAO, in collaboration with its partners, has also continued to further establish and develop the Facilitating Mechanism for the implementation of the Global Plan of Action, with the development of a Web-based Portal, a donors' database, and other relevant information.

Crop Production Systems - Sustainable Intensification, Diversification, and Biodiversity

17. Following the request by the Commission, the Crop and Grassland Service (AGPC) prepared a study on *"Plant Genetic Resources of Forage Crops, Pasture and Grasslands (FCPG)"* to value and discuss the role of forage crops, pasture and rangeland species and biodiversity for food and agriculture with particular emphasis on food security and sustainable agriculture and cropping systems. The study discusses also some forage crops, pasture and rangeland species (FCPG) that were insufficiently covered in the *First State of the World's Plant Genetic Resources for Food and Agriculture report*, and will also be used to provide information needed to update Annex 2 of the Report. FCPG are still poorly covered by the Consultative Group on International Agricultural Research (CGIAR) and there is a general need for more research, market development, inventories, and exchange of information.

[3] Afghanistan, Argentina, Armenia, Azerbaijan, Bangladesh, Brazil, Bolivia, Ecuador, Georgia, India, Iran, Kazakhstan, Mali, Madagascar, Mexico, Mongolia, Pakistan, Philippines, Sri Lanka, Tajikistan, Thailand, Turkey, Russian Federation, Uruguay and Uzbekistan.

18. *International Rice Commission* (IRC). Following the International Year of Rice in 2004, the 21st Session of the International Rice Commission was held in Chiclayo, Peru from 3 to 5 May 2006, during which a session was devoted to "*Genetic Improvement for Rice is Life in the farmers' fields"*. The Commission recommended the promotion, collaboration and exchange of information on rice genetic improvement and use.

2. Animal genetic resources

19. *The Global Strategy for the Management of Farm Animal Genetic Resources* provides a technical framework to advance work on animal genetic resources at regional and country level. It consists of four main components: an intergovernmental mechanism; a country-based planning and implementation infrastructure; a technical programme of work; and a reporting and evaluation element. Regular programme resources support core activities of the Global Focal Point for the Global Strategy based at FAO.[4]

20. Since the Tenth Regular Session of the Commission on Genetic Resources for Food and Agriculture, the primary focus in the context of the Global Strategy has been on the country driven preparation of *The State of the World's Animal Genetic Resources for Food and Agriculture*. Other FAO activities include the further development of the Domestic Animal Diversity Information System (DAD-IS), a global information and communication system and clearing house mechanism on animal genetic diversity for food and agriculture (http://www.fao.org/dad-is/); the establishment of a network of National and Regional Focal Points for animal genetic resources; strengthened and more targeted technical cooperation and partnerships with other organizations; the establishment of a number of technical tools, including the Primary and Secondary *Guidelines for Development of National Farm Animal Genetic Resources Management Plans*; and the organization of the Fourth Session of the Intergovernmental Technical Working Group on Animal Genetic Resources. A more detailed account of activities implemented under the Global Strategy since the Commission's Tenth Regular Session is presented in the information document *Report on activities under the Global Strategy for the Management of Farm Animal Genetic Resources.*[5]

21. *The State of the World's Animal Genetic Resources* provides a comprehensive global assessment of the roles, values and status of animal genetic resources, and the capacities of countries to manage these resources. The report was provided in draft form to the Working Group at its Fourth Session for comments. After the Commission's consideration and finalization[6] of the revised draft, *The State of the World's Animal Genetic Resources* will be presented at the International Technical Conference on Animal Genetic Resources in Interlaken, Switzerland, in September 2007.

22. The draft *Strategic Priorities for Action for the Sustainable Use, Development and Conservation of Animal Genetic Resources for Food and Agriculture* was prepared concurrently with *The State of the World's Animal Genetic Resources*. It is a strategic document that sets the agenda for further policy development at national and international level and generating public awareness of the roles and values of animal genetic resources. It is based on national strategic priorites extracted from Country Reports, on the outcome of regional consultations conducted in 2005, and on technical inputs provided during the preparation of *The State of the World's Animal Genetic Resources*. At its Fourth Session, the Working Group considered and reviewed the *Strategic Priorities for Action* and provided suggestions to the Commission on its further development.[7] The Report is expected to be finalized and adopted at the Interlaken Conference.

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[4] CGRFA-11/07/9.

[5] CGRFA-11/07/Inf.7.

[6] CGRFA-11/07/Inf.6.

[7] CGRFA-11/07/6.

23. *The International Technical Conference on Animal Genetic Resources* aims to achieve consensus on how to prioritize needs for the sustainable use, development and conservation of animal genetic resources and to raise awareness and appreciation of the various roles and values of these resources. The Working Group, at its Fourth Session, recommended the main outcomes of the Interlaken Conference to be the presentation of *The State of the World's Animal Genetic Resources*, recommendations for the further development of the Global Strategy and the adoption of a *Global Plan of Action for Animal Genetic Resources* through an *Interlaken Declaration*. It noted that the *Strategic Priorities for Action* would be the *Global Plan of Action*'s operational agenda, and that the Commission would oversee the implementation and monitoring of the *Plan.*[8]

24. The foreseen finalization of *The State of the World's Animal Genetic Resources* and adoption of the *Global Plan of Action*, including the *Strategic Priorities for Action* at the Interlaken Conference, will provide the basis for the Commission to work on the further development of policies and regulatory instruments for the sustainable management of animal genetic resources. The Working Group, at its Fourth Session, recommended to retain the Global Strategy for the Management of Farm Animal Genetic Resources as the FAO technical programme, "until FAO can realign support for the *Global Plan of Action for Animal Genetic Resources.*"[9]

3. Forest genetic resources

25. FAO provides technical support to member countries' national agencies in the conservation, management and sustainable use of forest genetic resources. The focus is on the transfer of information, analysis, knowledge and technologies, through a wide range of communication tools, publications and networking and twinning mechanisms.

26. International species and provenance trials are effective traditional means to study inter-specific and intra-specific variations of adaptive and productive traits in tree species. Series of trials have been established for socio-economically important species, by national institutions in collaboration with FAO. Such coordinated, multi-locational trials, are regaining interest as valuable material for research in relation to adaptation to climate change. Most recent activities have concentrated mainly on arid zones species, including neem (*Azadirachta indica*) through the *International Neem Network*. The assessment and analysis of trials, established in 1995 in 20 sites in 15 Asian and African countries, is ongoing with the support of the Danish Centre for Forest Landscape and Planning (SL-KVL), which recently integrated the former DANIDA Forest Seed Centre (DFSC). Efforts are currently concentrated on trials established in South-East Asia.

27. Within the framework of *Silva Mediterranea*, FAO initiated a systematic review of earlier species and provenance introductions of Mediterranean conifers with the support of the French National Institute for Agricultural Research (INRA). A synthesis on the status of the trials was published on the internet at www.fao.org/forestry/site/24289/en. The assessment, analysis and synthesis of trial results are undertaken in collaboration with conifer research networks of the International Union of Forestry Research Organizations (IUFRO) and the European Forest Genetic Resources Programme (EUFORGEN) to use these old sets of international trials for research projects on adaptation to climate change.

Publications

28. The following publications have been produced since the Commission's last session:

- *Forestry: A Preliminary review of biotechnology in forestry, including genetic modification* was published as a first attempt to provide statistical information on the extent and patterns of biotechnology research and applications in forest trees worldwide

[8] CGRFA-11/07/3-Paragraph 26.

[9] CGRFA-11/07/3-Paragraph 27.

(http://www.fao.org/docrep/008/ae574e/ae574e00.htm). An e-mail conference (June 2005), and an international workshop (November 2005) led to a publication on *the role of biotechnology for the characterization and conservation of crop, forest, animal and fishery genetic resources in developing countries*.

- In collaboration with Skov and Landskab (SL-KVL), FAO released *Seed and Forest Reproductive Material: Tree Seed Training and Extension Resources*, a global review of extension manuals of relevance to forest seed, on the Internet (http://www.dfsc.dk/Extensionstudy/index.html), to facilitate access to extension resources concerning tree seeds and related topics, and make it easier for extension workers to produce new, appropriate resources.
- The experience gained in the conservation and management of forest genetic resources was synthesized and summarized in a series of technical guides that FAO, Bioversity International and SL-KVL jointly published: *Forest genetic resources conservation and management* (1) Overview, concepts and some systematic approaches, (2) In managed natural forests and protected areas (*in situ*) and (3) In plantations and genebanks (*ex situ*).
- A publication entitled *In situ conservation of wild plant species – a critical global review of good practices*, was produced in collaboration with Bioversity International to contribute to the understanding of *in situ* conservation of target species of different types, including medicinal and aromatic plants, crop wild relatives, fruit trees and shrubs, ornamental and other valuable species.

29. The Forestry Department's programme *Management of wildlife and protected areas* focused on sustainable management of wildlife for food and income generation. Support has been provided to strengthen the policies and institutions for sustainable management of wildlife and protected area in Africa, Central Asia, Caucasus and Balkans. A publication on sustainable management of Barbary Sheep (*Ammotragus lervia*) was produced for the Maghreb region. Others focal areas include mitigation of human-wildlife conflicts, and support to the development of laws for sustainable wildlife management. The programme also assists member countries to fulfill the requirements of international conventions, like the Convention on International Trade in Endangered Species of wild fauna and flora (CITES). The Central African World Heritage Forest Initiative (CAWHFI) is being implemented in cooperation with the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Foundation (UNF), The United Nations Fund for International Partnerships (UNFIP), French Cooperation and partner NGOs. The project aims to combat illegal hunting and regulate bush meat trade; strengthen law enforcement for the protection of key trans-border protected areas; improve the management of key protected areas; and prepare the nomination of new trans-border World Heritage sites in the Congo Basin forests.

30. *The Global Forest Resources Assessment* (FRA) 2005 mainly included information on forests managed for the conservation of biological diversity. It was agreed that FRA 2010 should provide forest-related information for the assessment of the progress of the CBD towards the 2010 biodiversity target. Methods for reporting should be examined on areas of forest in protected areas and their management effectiveness and on trends in the genetic diversity of forest tree species. In connection to this requirement, a review of the state of development of forest genetic diversity indicators was conducted under a *GEF 2010 Biodiversity Indicators Partnership project*, to determine the current status and plan for further development of indicators selected for monitoring progress towards the CBD 2010 target. This work is carried out in close collaboration with the *Streamlining European 2010 Biodiversity Indicators initiative* (SEBI 2010).

31. Under International Collaboration, FAO worked with IUFRO, Future Harvest Centres (CGIAR), the Organisation for Economic Co-operation and Development (OECD), universities, national forest services and research institutes. FAO continued to provide inputs to, and closely followed, the implementation of the CBD expanded work programme on forest biological

diversity, through participation in meetings of the Ad-Hoc Technical Expert Group. FAO is hosting the next meeting of the Group in May 2007. FAO collaborated with IUFRO in a Division 2 Joint Conference on *Low input breeding and genetic conservation of forest tree species*, in October 2006, in Antalya, Turkey, and with Bioversity International in an expert consultation on *Tree diversity in ecosystem restoration in the Asia-Pacific region*, in December 2006, in Chiang Mai, Thailand.

32. Information Activities have continued through the upgrading of FAO's worldwide information system on forest genetic resources (REFORGEN) and transfer to the FAO Forestry Department information system FORIS, which will improve management and updating facility. The homepage (http://www.fao.org/forestry/) contains detailed information on programmes and activities carried out in the field of forest genetic resources, and links to the work of associated programmes within and outside FAO.

33. The FAO Panel of Experts on Forest Gene Resources held its fourteenth session in December 2006. The Panel discussed technical proposals to better frame and streamline FAO's work programme on forest genetic resources, and highlighted a number of priority actions. The Report of the Thirteenth Session of the Panel of Experts on Forest Gene Resources (2003) is available in English, French and Spanish, in printed version, and on the Internet: http://www.fao.org/docrep/007/j4027e/j4027e00.htm.

4. Aquatic genetic resources

34. The Fisheries and Aquaculture Management Division (FIM) is the lead unit for fishery genetic resources, with assistance from the Fishery and Aquaculture Economics and Policy Division (FIE). The Fishery and Aquaculture Information and Statistics Service (FIES) provides information, mainly at species level, on capture fishery and aquaculture production, and other statistics.

35. Information on fishery genetic resources is provided as guidelines, codes of conduct, protocols and technical publications (CD RoM, Fishery Technical Papers and Fishery Circulars) in scientific publications, conference proceedings, the *FAO Aquaculture Newsletter* and on the Fisheries and Aquaculture Department's internet site (http://www.fao.org/fi/default.asp).

36. Programme Elements *Monitoring, Management and Conservation of Fishery Resources and Monitoring* and *Management and Conservation of Resources for Aquaculture Development*[10] both support the implementation of the Code of Conduct for Responsible Fisheries and other international instruments through various activities, including the participation in meetings of FAO and other organizations such as the CBD and CITES; the publication of guidelines on fisheries and aquaculture; and the organization of international forums on fishery genetic resources. Activities during 2005-2006 included:

- Strengthening cooperation with the Commission on Genetic Resources for Food and Agriculture (CGRFA). With support of the CGRFA Secretariat, the Fisheries and Aquaculture Department commissioned four review papers on the status and trends of fish genetic resources in aquaculture, capture fisheries, the deep sea, and genomics and convened an expert workshop in Victoria, Canada on the *Status of aquatic genetic resources and trends in their management for capture fisheries and aquaculture: a basis for international policy.*

[10] The past structure of the Fisheries and Aquaculture Department grouped many capture fishery and aquaculture programme elements together in the Inland Fishery and Water Resources Service (FIRI). The current structure separates capture fisheries and aquaculture into different programme elements. However, since single activities in 2005 through 2007 address both programme elements, they are reported together here.

- Participation in international fora to develop and promote responsible aquaculture and fisheries, such as with the WorldFish Center on genetic management of aquaculture stocks in Sub-Saharan Africa, Ghana March 2006; a special symposium during the 14th Session of the Committee on Inland Fisheries of Africa on use of genetically improved seed; participation in a think tank on communication strategies for fish genetic resources, September 2006.
- Revision of the Database of Introductions of Aquatic Species (DIAS) that consists of both an online (http://www.fao.org/figis/servlet/static?dom=collection&xml=dias.xml) and a CD RoM version.
- Improved studies and analysis of alien species through the production of several publications and an information package on CD RoM, containing full text versions of major international instruments and other relevant publications.
- Improved documentation of aquatic animal biodiversity in rice-based ecosystems and their contribution to nutritional food security.
- Elaboration of breeding protocols on threatened and endangered species used in fisheries and aquaculture, to the purpose of which the Darwin Initiative on Mekong Giant Catfish was established and an international workshop on sturgeon stock enhancement in the Caspian Sea organized.
- Improvement of biological data on marine resources is run by the Species Identification and Data Programme to produce taxonomic guides and faunistic lists on commercially important fishery resources.
- Other key activities during 2005-2006 included:
    - the preparation of additional publications on the Eastern Central Atlantic Guide covering the area from the Straits of Gibraltar to 23°S. Seventy six authors each well renown in his/her speciality are preparing the Guide sections, covering 306 groups and/or families occurring in the area;
    - the Catalogue of Hagfishes and Lampreys, which is under preparation;
    - work on the electronic illustration archive that has also continued. The archive contains about 30,000 images of various species including anatomical details useful for identification.

37. Through its main programme *Provision of Fisheries Information and Statistics*, the Fishery and Aquaculture Information and Statistics Service compiles country data on capture fisheries and aquaculture production as well as on value and other important statistics on fish and fish products. Key activities in 2006 – 2007 included:

- Information on global fisheries and aquaculture, including statistics on production in terms of quantity, aquaculture production value, human consumption of fish, trade, fleets, farms, resources, and other key topics, which has been published in statistical publications, such as the *State of World Fisheries and Aquaculture* and the *State of World Aquaculture*. Most statistics are at species or at a higher taxonomic level, although there are also some statistics on the production of hybrids for aquaculture.
- The FishStat database, which disseminates most statistical information provided by Members and other sources, providing a means to analyze status and trends.

38. *Technical Support Services to Members and the Field Programme in the area of Fishery Resources.* Key activities during 2005-2006 included:

- FAO/ Norway support to develop a fish hatchery to improve income generation in Bosnia Herzegovina. 2004-present. The Project is developing a recreational fishery based on hatchery enhancement of local salmonid species to benefit war invalids.

- FAO/Netherlands Partnership Programme (FNPP) Biodiversity component, support to document alien species, aquatic animal diversity in rice-based ecosystems and the nutritional aspects of aquatic animal diversity in Lao PDR and Kenya.

39. *Technical Support Services to Members and the Field Programme in the area of Aquaculture.* Key activities included:

- Producers' Workshop on *Genetic Management of Aquaculture Stocks in Sub-Saharan Africa*, held in Accra, Ghana, 27 February - 3 March 2006.

5. Biodiversity of micro-organisms & invertebrates

Biological pest control

40. Biological pest control is an integral part of Integrated Pest Management. It consists of the use of living organisms such as beneficial insects or parasites to reduce agricultural pest populations. For this purpose various specific organisms, such as natural enemies, insects, mites, nematodes and plant diseases, particularly fungi are used. The strategies for the use of this method are based either on the introduction of exotic natural enemies, into an area where they do not normally occur, for the control of a specific pest, method widely known as Classical Biological Control; reproducing and using existing natural enemies in the country to such a level as to achieve the desired pest reduction, i.e. augmenting their population; or naturally preserving the existing enemies in order to increase their impact on the target pests, which can also be achieved with reduced use of chemical insecticides.

41. The major output of FAO in the area of biological pest control activities over the past 15 years has been the preparation and approval of an international standard for the export, shipment, import and release of biological control agents and other beneficial organisms (ISPM No. 03), which provides guidelines for risk management related to the export, shipment, import and release of biological control agents and other beneficial organisms. The standard lists the related responsibilities of contracting parties to the International Plant Protection Convention, National Plant Protection Organizations or other responsible authorities, importers and exporters (as described in the standard). It also addresses biological control agents capable of self-replication (including parasitoids, predators, parasites, nematodes, phytophagous organisms, and pathogens such as fungi, bacteria and viruses), as well as sterile insects and other beneficial organisms (such as mycorrhizae and pollinators), and includes those packaged or formulated as commercial products. Provisions are also included for import for research in quarantine facilities of non-indigenous biological control agents and other beneficial organisms.

42. Various projects have been implemented by FAO to combat particular pests, including alien invasive plants, in various countries of Africa, Asia and Latin America, where biological control has been the preferred strategy. Good examples have been the introduction of specific insects for the control of water hyacinth in more than 14 countries of these regions, including the initiation of the successful exercise in Lake Victoria. FAO has safely introduced other biological agents for the control of floating alien plants as water lettuce and water fern. The latter was effectively controlled biologically in the Senegal River in 2002. With the assistance of FAO some countries are engaged in the introduction of specific beetles for the prevention of spread of mesquite invasive plants. To this end, institutions such as Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO), The International Institute of Tropical Agriculture (IITA), the International Institute of Biological Control (IIBC), El Instituto Mexicano de Tecnología del Agua (IMTA) and the University Florida collaborated with FAO providing the necessary know-how for the development of this control strategy. In all these projects, FAO has facilitated the development of biological control providing necessary in-country training to the national specialists on methods for insect rearing, release and monitoring.

43. As a result of this work, several developing countries have gained expertise on biological pest control based on practical experiences. This facilitates the cooperation of these countries

through the exchange of technical information on the subject and by assisting each other in facing other pest problems using this strategy, which is environmentally safe and does not pose any risk to crop production and biodiversity. The projects conducted using biological control as their main strategy have demonstrated their potential and economical feasibility. The development of biological pest control offers new possibilities to countries that face pest problems, using environmentally friendly agents and at the same time significantly reducing the consumption of chemical pesticides.

Micro-organisms of relevance to food processing

44. Recent scientific work has suggested that probiotics play an important role in immunological, digestive and respiratory functions, and that they could have a significant effect on the alleviation of infectious diseases in children and other high-risk groups. In parallel, the number and type of probiotic foods and drinks that are available to consumers, and marketed as having health benefits, has increased considerably.

45. In view of this growing popularity of probiotic foods, and the lack of international consensus on the methodology to assess their efficacy and safety, FAO and the World Health Organization (WHO) initiated work to examine the scientific evidence on the functional and safety aspects of probiotics in food in 2001. A joint WHO/FAO consultation generated a number of recommendations for further research, as well as priorities for the evaluation of safety and nutritional aspects of probiotics and regulatory requirements. As a follow up, FAO and WHO convened an expert working group to develop *Guidelines for the Evaluation of Probiotics in Food,* to provide a methodology for use in the evaluation of probiotics, and define the criteria and specific levels of scientific evidence needed to make health claims for probiotic foods.

46. The results and recommendations of the consultation and the *Guidelines for the Evaluation of Probiotics in Foods* have been presented to the Codex Committee on Food Labelling (CCFL) and the Codex Committee on Nutrition and Foods for Special Dietary Uses (CCNFSDU). It is hoped that the *Probiotic Guidelines* will be incorporated or taken as example for the Codex standards on health and nutrition claims and as a scientific assessment of a novel food.

47. FAO has continued to work in the area of probiotics as part of the FAO/IDF (International Dairy Federation)/ISO (International Standards Organization) Joint Action Team on probiotics developing methods to determine species and strain identity, physiological properties and metabolic activities, antibiotic resistance, as well as functionality.

Pollinators

48. Over the past decade, the international community has increasingly recognised the importance of pollinators as an element of agricultural diversity supporting human livelihoods. Yet mounting evidence points to a potentially serious decline in populations of pollinators. Maintaining and increasing yields in horticultural crops under agricultural development through better conservation and management of pollinators is critically important to health, nutrition, food security and better farm incomes for poor farmers.

49. The CBD established an *International Initiative for the Conservation and Sustainable Use of Pollinators* (IPI) and requested the development of a plan of action coordinated by FAO. The Plan of Action of the IPI is structured around four elements: assessment, adaptive management, capacity building and mainstreaming. FAO has provided coordination and technical assistance to member countries with respect to each of these four elements, using both Regular Programme and extrabudgetary funds.

50. FAO has assisted in the formation of an *African Pollinator Initiative*, developed through a regional meeting with participation of pollination experts from 16 countries in Africa; the initiative has worked on both practical and policy levels in several countries.

51. The first *Rapid Assessment of Pollinators' Status Report*, coordinated by FAO, will be presented to the CBD in 2008. Over fifty case studies have been submitted, documenting activities and findings from thirty-three countries. FAO assisted a number of member countries to test pilot methods of monitoring pollinator status in crop ecosystems, assessing the economic contribution of pollinator-friendly practices to farmers' livelihoods and developing pollination management plans on a community level. Collaborations have been formed with the taxonomic community and the Global Biodiversity Information Facility (GBIF) to provide relevant taxonomic information as needed to pollination practitioners.

52. To build the capacity of farmers and land managers to implement pollinator-friendly practices, and policymakers to develop pro-pollinator policies, FAO has coordinated the development of a GEF/UNEP global project on *Conservation and Management of Pollinators for Sustainable Agriculture, through an Ecosystem Approach*, with the participation of seven countries. Through the development of good agricultural practices for pollination services, built on an extended knowledge base, capacity will be increased and awareness raised to promote wise management of pollinators and their services.

53. The CGRFA could give their appreciation of the role of pollination in sustaining agricultural productivity and quality, critical to human livelihoods. More information is available in the Information document *Pollinators, neglected biodiversity of importance to food and agriculture* (CGRFA-11/07/Inf.15).

Soil biodiversity and soil ecosystem management

54. New opportunities exist for increasing the attention of land users and practitioners and technical and policy levels to restoring degraded soils, enhancing productivity and improving pest-disease control through the sustainable management of soil biodiversity, and for FAO to work with partners in this field.

55. FAO and other relevant organizations, were invited to facilitate and coordinate the International Initiative for the Conservation and Sustainable Use of Soil Biodiversity established by the CBD in 2002. In 2006, the CBD endorsed a framework for action as a basis for the initiative's implementation, requesting FAO's technical and policy support. It called for enhanced cooperation between FAO and other international organizations to implement the initiative.

56. Given the limited human and financial resources available in FAO, the Land and Plant Nutrition Management Service has in recent years only been able to provide support to a number of selected activities on soil biodiversity as part of overall land resources management, with an emphasis in areas of Africa which suffer the double burden of land degradation and food insecurity.

57. FAO initiated work in East Africa with Farmer Field Schools (FFS) to enhance understanding of direct links between soil biodiversity, soil structure and plant health and increase attention to improving soil biological management. Improved soil biological management and soil functioning are among the important recognised benefits of sustainable production systems and can be readily measured by farmers using such simple field observations. With FAO support, by 2006 forty five FFS groups had been set up in Tanzania by District Agricultural Offices, with technical support of Lake Zone Agricultural Research Institutes on improved land and water management. Agro-Ecosystems Analysis (AESA) for soil productivity improvement and soil and plant indicators were developed to observe the effects of management practices on soil health using soil biological indicators, notably plant rooting and symbiotic micorrhiza fungi and Rhizobium bacteria nodules, earthworms, termites and soil organic matter, and their effects on soil structure and nutrient cycling.

58. *Liaison with international partners has included, inter alia:*

- The global GEF project "Conservation and sustainable management of below ground biodiversity", coordinated by the Tropical Soil Biology and Fertility Programme (TSBF-CIAT) and hosted by the World Agroforestry Centre (ICRAF)
- The global GEF/UNEP/FAO project on Land Degradation Assessment in Drylands (LADA), with collaborative government agencies from Argentina, Cuba, China, Senegal, South Africa and Tunisia. Biodiversity is recognised as an important aspect of land resources degradation and indicators for above-ground biodiversity are being included in the assessment.
- Cooperation with the CBD. In 2006, FAO participated in a side event on soil biodiversity at COP-8 in Curitiba, Brazil together with the Brazilian Agricultural Research Corporation (EMBRAPA). FAO also participated in the African Regional Workshop on sustainable use of biological diversity in Kenya.

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

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