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منظمة الأغذية
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للأمم المتحدة

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Food
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Продовольственная и
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организация
Объединенных
Наций

Organización
de las
Naciones
Unidas
para la
Agricultura
y la
Alimentación

Item 8 of the Provisional Agenda

COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Thirteenth Regular Session

Rome, 18 – 22 July 2011

SUBMISSIONS BY INTERNATIONAL ORGANIZATIONS ON THE PRIORITISED THEMES OF THE SESSION

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SUBMISSIONS BY INTERNATIONAL ORGANIZATIONS ON THE PRIORITISED THEMES OF THE SESSION

I. INTRODUCTION

1. The Commission on Genetic Resources for Food and Agriculture (Commission), at its Eleventh Regular Session, thanked the many international organizations that had submitted reports over the years, which had made a significant contribution to the Commission's work. The Commission decided that, in the context of the Multi-Year Programme of Work, future consultations with such organizations would focus on matters being addressed at each session.¹

2. On 20 April 2011, the Director-General of FAO invited international organizations, including inter-governmental and non-governmental organizations, to provide focused information on their programmes, activities and policies relevant to the prioritized themes of the Commission's Thirteenth Regular Session, including:

Plant genetic resources

- Draft updated *Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture*
- Cooperation with the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture

Aquatic genetic resources

- Review of information base for aquatic genetic resources, and key issues for *The State of the World's Aquatic Genetic Resources*

Cross-sectorial matters

- Review of ways and means of considering the application and integration of biotechnologies in the conservation and utilization of genetic resources for food and agriculture
- Climate change and genetic resources for food and agriculture

Management of the Multi-Year Programme of Work

- Progress report/ periodic assessment/ review of the Multi-Year Programme of Work.

3. The following international organizations provided submissions in response to the invitation by the Director-General: Action Group on Erosion, Technology and Concentration (ETC Group); Bioversity International;² CAB International (CABI); Centro Agronómico Tropical de Investigación y Enseñanza (CATIE); Convention on Biological Diversity (CBD); Fridtjof Nansen Institute (FNI); International Center for Agricultural Research in the Dry Areas (ICARDA); International Center for Tropical Agriculture (CIAT); International Crops Research Institute for the Semi-Arid Tropics (ICRISAT); International Development Research Centre (IDRC); International Federation of Organic Agriculture Movements (IFOAM); International Institute for Environment and Development (IIED); International Institute of Tropical Agriculture (IITA); International Livestock Research Institute (ILRI); International Maize and Wheat Improvement Center (CIMMYT); International Rice Research Institute (IRRI); Organisation for Economic Co-operation and Development (OECD); Practical Action; Secretariat of the Pacific Community (SPC); South East Regional Initiatives for Community Empowerment (SEARICE); Third World Network (TWN); United Nations Environment Programme

¹ CGRFA-11/07/Report, paragraphs 83-84.

² Reporting on activities in its own right, and also providing a report on behalf of the System-wide Genetic Resources Programme (SGRP) of the Consultative Group on International Agricultural Research (CGIAR), which was concluded at the end of 2010.

(UNEP); World Agroforestry Centre; World Intellectual Property Organization (WIPO); and World Trade Organization (WTO).

4. The submissions by international organizations have been grouped according to the prioritized themes of the Commission's Thirteenth Regular Session and are presented in the alphabetical order of the organizations under each theme. The submissions are given in the language in which they were received.

II. SUBMISSIONS ON THE PRIORITIZED THEMES OF THE COMMISSION'S THIRTEENTH REGULAR SESSION

2.1 Plant genetic resources

DRAFT UPDATED GLOBAL PLAN OF ACTION FOR THE CONSERVATION AND SUSTAINABLE UTILIZATION OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

BIOVERSITY INTERNATIONAL REPORTING ON THE SYSTEM-WIDE GENETIC RESOURCES PROGRAMME (SGRP)

5. Bioversity International presents an overview of activities undertaken under the System-wide Genetic Resources Programme (SGRP) in relation to genetic resources since 2009 through the end of 2010, when the SGRP was concluded. Bioversity International was the convening centre for the SGRP. The information provided under SGRP in this report draws heavily from the CGIAR Centres' report to the Fifth Session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture (ITWG-PGR), 2011, which was compiled by the SGRP.

6. At its Twelfth Regular Session, the Commission on Genetic Resources for Food and Agriculture (FAO Commission), considered updating the *Global Plan of Action* (GPA) that was adopted by 150 countries in Leipzig in 1996. The Commission requested FAO to prepare the updated GPA based primarily on *The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture* (SOWPGR-2) and, in particular, on the gaps and needs that were identified, taking into account further contributions from Governments, as well as inputs received from regional meetings and consultations. It further decided that the updated GPA would be considered at its Thirteenth Regular Session.

7. CGIAR Centres participated in and contributed to six of the seven Regional Consultations organized by FAO and regional partners to obtain inputs for updating the GPA. Bioversity and national partners collaborated with FAO in the organization of a Regional Consultation for Europe, which was convened in Tirana, Albania, from 19-20 May, 2010. An African Regional Consultation was held in Nairobi, Kenya, from 2-3 June 2010, with technical and logistical support from Bioversity in collaboration with the Kenyan Agricultural Research Institute (KARI). Representatives from 32 African countries were present, as well as observers from the SADC Plant Genetic Resources Centre (SPGRC), the Eastern Africa Plant Genetic Resources Network (EAPGREN), IITA, and ICRISAT. The Regional Consultation for Latin America and the Caribbean was held in La Antigua, Guatemala, from 9-10 August 2010. It was organized in collaboration with the International Treaty, and with the support of the Government of Spain and the Guatemalan Ministry of Agriculture and Livestock. The consultation was attended by representatives from 22 countries and experts from the SGRP Secretariat, Bioversity, and CIAT. The Asian Regional Consultation took place from 7-8 September 2010 in Chiang Mai, Thailand, and was attended by a representative from Bioversity. The Near East, North Africa and Central Asia Regional Consultation was convened in Aleppo, Syrian Arab Republic, from 2-3 November 2010, with the collaboration of ICARDA. The South Pacific Regional Consultation took place in Suva, Fiji, from 7-10 December 2010, in collaboration with the FAO Commission, the International Treaty, and the Secretariat of the Pacific Community, and included the participation of a representative from Bioversity.

8. The draft GPA was presented and discussed at the Fifth Session of the ITWG-PGR in April 2011 and following recommendations of the Working Group, will be presented at the Thirteenth Regular Session of the CGRFA.

CENTRO AGRONÓMICO TROPICAL DE INVESTIGACIÓN Y ENSEÑANZA (CATIE)

Conservación y mejoramiento in situ y ex situ

9. CATIE conserva colecciones de importancia mundial (café, cacao, pejíbaye y cucurbita) y de importancia regional (chile, tomate) para la región. Es interés de CATIE continuar cooperando con los pequeños agricultores en los métodos de conservación de germoplasma, además establecer un trabajo de mejoramiento genético participativo con agricultores de la región centroamericana, especialmente con material silvestre para atenuar el efecto del cambio climático y contribuir con la seguridad alimentaria.

10. CATIE ha generado materiales mejorados de cacao y café que contribuirían a mejorar la calidad de vida de los agricultores de la región. Los clones de cacao son resistentes a monilia (*Moniliophthora roreri*) y altamente productivos, estos están siendo distribuidos a pequeños productores de Centroamérica. Los materiales de café son resistentes a roya y nemátodos, altamente productivos y de excelente calidad de taza.

11. Es necesario procurar la colaboración internacional para la asignación de recursos extraordinarios para asegurar el mantenimiento de los recursos genéticos conservados por CATIE. Estos recursos genéticos de importancia mundial y regional, la mayoría de ellos material silvestre recolectado en la región constituye un recurso valioso para la agricultura; sin embargo, los fondos insuficientes podría afectar la continuidad de su conservación.

Regeneración y caracterización de recursos genéticos

12. Gracias al apoyo financiero del Fondo Mundial para la Diversidad de Cultivos y con recursos propios el CATIE está regenerando sus colecciones de campo y de semillas ortodoxas, especialmente las accesiones únicas que están en amenaza de pérdida. Hasta el momento han sido regenerados exitosamente un 30% del total conservado.

Institucionalidad y creación de capacidad

13. CATIE brinda capacitación a agricultores, técnicos, estudiantes e investigadores en diversos temas sobre el manejo de la Agrobiodiversidad como métodos de conservación, documentación de germoplasma, utilización de recursos genéticos, importancia de los recursos genéticos para la seguridad alimentaria y adaptación para el cambio climático, entre otros. CATIE forma parte de la Red REMERFI desde la cual fomentará el uso sostenible de los recursos genéticos en la región.

INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS (ICARDA)

Collaboration with FAO

14. Several activities were organized jointly between ICARDA and FAO, including the contribution to *The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture* by the report for the Near East and North Africa region and by two thematic studies on "Managing plant genetic resources in the agro-ecosystem: global change, crop associated biodiversity and ecosystem services" and on "Plant genetic resources for forage crops, pastures and rangeland species". It has organized in collaboration with FAO on 02-03 November 2010, the workshop to update the *Global Plan of Action* of PGRFA for the Near East and North Africa region.

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

15. The ICRISAT genebank has restored germplasm to the countries when their national collections were lost due to natural disasters or due to lack of proper storage facilities. To safeguard assembled germplasm seeds were securely conserved at preferred storage conditions with adequate

security systems for present and future use. Genetic integrity is maintained by pollination control while regenerating cross-pollinated crops like sorghum, pearl millet and pigeonpea. ICRISAT has active collaboration with Bioversity International and other CG genebanks in establishing the Crop Germplasm Knowledge base.

16. Concerted efforts were made to fill gaps in the genetic diversity of existing collections. Strong linkages were developed with NBPGR in India and NARS in other countries for collecting and/or assembling germplasm from priority areas.

Expanding ex situ conservation activities

17. Seeds of ICRISAT mandate crops are typically orthodox in nature, however, some wild species accessions of groundnut and pearl millet, which do not produce adequate seeds for conservation, are maintained as live plants in a botanic garden and screen houses.

18. ICRISAT, GCDT and NARS in Asia and Africa have identified important national collections for regeneration and safety duplication at ICRISAT, Patancheru. ICRISAT has so far deposited seed samples of 66,000 accessions to the Svalbard Global Seed Vault, Norway. To enhance utilization of conserved germplasm, three regional genebanks in Africa, Niamey (Niger), Nairobi (Kenya) and Bulawayo (Zimbabwe) were established. These genebanks are maintaining the regional working collections and catering to the germplasm needs in those regions.

19. ICRISAT has developed representative core collections (10% of entire collection) of sorghum (2246 accessions), pearl millet (2094 accessions), chickpea (1956 accessions), groundnut (1704 accessions), pigeonpea (1290 accessions), finger millet (622 accessions) and foxtail millet (155 accessions) and mini core collections (10% of core or 1% of entire collection) of chickpea (211 accessions), groundnut (184 accessions), pigeonpea (146 accessions), sorghum (242 accessions), pearl millet (238 accessions), finger millet (80 accessions) and foxtail millet (35 accessions). Mini core is now an International Public Good and a gateway to access the genetic diversity by global community. Mini core collections are part of project proposals submitted in several countries and are subject of investigation for thesis research in India and the USA. Evaluating core and mini core collections at ICRISAT and NARS in India and Africa identified new sources for agronomic and nutritive traits in finger millet and foxtail millet.

20. ICRISAT has uploaded information (2005-2010) as part of the Information Sharing Mechanism on GPA Implementation.

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (IDRC)

21. The International Development Research Centre (IDRC) has a long history of supporting work on genetic resources for food and agriculture. For example, the Centre contributed to *The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture*, published in 2009 by the FAO. IDRC supported the preparation of the report by financing a thematic study on the impact of national, regional and global agricultural policies and agreements on conservation and use of plant genetic resources for food and agriculture.

INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA)

22. IITA's main objectives related to the Plant Genetic Resources theme of the updated *Global Plan of Action (GPA)* are listed below with examples of recent achievements or on-going activities.

- Objective 1: Maintain existing collections at international standard

IITA is committed to the 'in perpetuity' maintenance of the international collections (estimated annual cost = USD 1.1 millions). Such engagement is made possible by the financial support of various international organizations, OECD countries, and foundations. Substantial part of the conservation funds is presently transiting via the Global Crop Diversity Trust (GCDT).

- **Objective 2: Maintain unique germplasm and increase crop gene pool**

IITA is taking actions to improve the diversity of the collection and ensure accession uniqueness. IITA is investing in the development and use of molecular tools for the authentication of germplasm, its uniqueness and diversity. For example, the cassava collection was recently finger printed for duplicate identification. Where possible, GIS data guides new material introduction in the international collection. Collecting missions have recently been undertaken in Nigeria and Guinea to respectively enrich the international collections of cowpea wild relatives and *Manihot esculenta*. These missions were respectively done in partnership with IRAG (Institut de Recherche Agronomique de Guinée) and NACGRAB (National Center for Genetic Resources and Biotechnology). All newly acquired germplasm involved SMTA.
- **Objective 3: Reduce the cost of clonal crop conservation**

IITA is exploring cryopreservation to reduce the conservation cost of clonal crops which was estimated 30 times more expensive than seed crop conservation on an annual basis (IITA report on costing study). Cryopreservation procedures have been developed and cryobanking is to start in 2011 at IITA. The conservation of genes rather than genotype is now foreseen as an important complementary component for the long term conservation of clonal crop diversity. In this context, IITA is engaged in the production of self pollinated botanical seeds of cassava. As cassava botanical seeds are virus free, they should also facilitate international germplasm exchange of the crop.
- **Objective 4: Insure germplasm safe movement**

The seed and clonal germplasm of the five crops conserved by IITA are hosts of numerous pathogens of high quarantine importance (eg. cassava brown streak disease, banana bunchy top, etc.). IITA's Germplasm Health Unit (GHU) is a key partner for the Genebank that ensure safe exchange of germplasm through indexing, production of pathogen-free planting material and ensure compliance with national and international quarantine procedures. GHU is also involved in developing reliable indexing/diagnostic tools for both seed and clonal crops; review germplasm regeneration procedures for production of clean seed/seedlings production. IITA has established virus-free germplasm of most of the cowpea core collection and 50% of the cassava collection. IITA's Genebank and GHU facilitate transfer of improved varieties from continent to another. For instance, facilitated taro blight resistant cocoyam from the South Pacific Community to West Africa to manage taro blight epidemic in West Africa; facilitated whitefly resistant cassava germplasm from CIAT, Columbia; and drought tolerant maize germplasm from Mexico.
- **Objective 5: Share responsibilities for the conservation and use of PGR**

IITA is fully engaged in building the global system for plant genetic resources conservation and use. During the past two years, IITA has led the development of the strategy for the conservation and use of yam and cowpea genetic resources. So far, the IITA Genebank has been selected by 11 country partners as host institute for the safe duplication of their genetic resources. Transfers already took place for yam (from Benin, Togo, Ghana) and cowpea (Azerbaijan). IITA participated in the FAO African Regional Consultation for the updating of the *Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture* (GPA), as well as several consultation meetings organized by GCDT aiming at sharing responsibilities.
- **Objective 6: Adding value to the international collections**

Most of the germplasm maintained at IITA has been characterized for morphological descriptors and core subsets have been defined for the main collections. Efforts are on going to develop joint characterization/evaluation trials with users focusing on the identification of traits of immediate interest in the collection.

- Objective 7: Contribute to the capacity development of national partners
IITA is taking part in the capacity development of national partners in the field of biotechnology applied to conservation and use of genetic resources (such as finger printing, cryotherapy, cryopreservation, mass propagation, molecular diagnostics, etc).

23. In addition to these center's own activities, IITA is contributing to the collective activities of the ex 'System Wide Genetic Resource Program of the CGIAR' i.e. SINGER, GENESIS, KNOWLEDGE BASE.

INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)

24. Contribution to *Global Plan of Action* for Plant Genetic Resources:

- Participation in regional meetings for the implementation of the *Global Plan of Action*.
- Conservation - Conserving and studying 19,000 accessions (1600 species and 300 genera) of forage grasses, legumes and fodder tree species. Quality assured through monitoring of viability and germplasm health. Upgraded molecular and seed germination laboratories to enhance capacity for germination tests, safety duplication and regeneration.
- Collaborative work and knowledge sharing –Contributor on forages to the genebank knowledge base (<http://croptgenebank.sgrp.cgiar.org/>). Contributions to CGIAR's project "Collective Action for the Rehabilitation of Global Public Goods in the CGIAR Genetic Resources System: Phase 2" (GPG2) on forage registry, safety duplication, quality management and genebank best practices. Dissemination of knowledge for emerging Napier diseases (stunt and smut) to reduce their impacts in Africa (Ethiopia, Kenya, Uganda, Tanzania) with the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) and national partners (<http://sites.google.com/site/napiergrassdiseaseresistance/>).
- Use –Key species of *Desmanthus* and *Trifolium quartinianum* have been characterized. Main grass species were evaluated in replicated experiments for biomass productivity and nutritional value.
- Services – Supply of starter forage seeds: 293 in 2009 (Ethiopia, Burundi and Colombia) and 240 in 2010 (Ethiopia and Kenya). Fact sheets of forage species were updated and some translated to local languages.

INTERNATIONAL MAIZE AND WHEAT IMPROVEMENT CENTER (CIMMYT)

25. The International Maize and Wheat Improvement Center (CIMMYT) is a non-profit research and training organization headquartered in Mexico. Its mission is to sustainably increase the productivity of maize and wheat systems to ensure global food security and reduce poverty. CIMMYT works with and brings together public research and extension organizations, private companies, advanced research institutes, NGOs, and farmer associations in countries worldwide, working pragmatically and apolitically to fight hunger and poverty.

26. CIMMYT has contributed to formulating and updating the *Global Plan of Action* (GPA). There is close correspondence between many of CIMMYT's activities and the priority activities of the GPA. The work on *ex situ* conservation is a basic prerequisite for all CIMMYT's work.

INTERNATIONAL RICE RESEARCH INSTITUTE (IRRI)

27. IRRI has contributed to formulating and updating the GPA. There is close correspondence between many of IRRI's activities and the priority activities of the GPA. The work on *ex situ* conservation (activities 5-8) is a basic prerequisite for all IRRI's work. In terms of percentage of resources allocated, the bulk of IRRI's portfolio focuses on sustainable use (especially GPA activity

10 through GriSP³ theme 2) and capacity building (especially activities 15-17, 19). IRRI also contributes to all other GP activities as appropriate to achieving its mission.

SECRETARIAT OF THE PACIFIC COMMUNITY (SPC)

28. The Pacific Regional Consultation on Strengthening Conservation and Sustainable Use of PGRFA in the Pacific Island Countries was held in Fiji on 7-10 December 2010. The meeting was organized by the FAO in collaboration with the SPC. It was attended by 28 participants from 14 Pacific Island countries and representatives from national, regional and international organizations. The majority of the participants were members of the Pacific Plant Genetic Resources Network (PAPGREN). Two days were devoted to the updating of the GPA.

WORLD AGROFORESTRY CENTRE

29. The World Agroforestry Centre contributes to conservation of indigenous fruit trees (*ex situ* and *circa situ*) in West and Central Africa, Sahel, Southern Africa, East Africa and South Asia, thereby contributing to food security. Through its Participatory Tree Domestication Program, and fruit tree portfolio approaches, conservation, propagation and consumption of fruits to reduce micronutrient malnutrition is promoted.

30. International and national cooperation with other organizations in capacity building, and exchange of information is promoted. PhD and M.Sc students are drawn from various universities globally on exchange programs to develop new knowledge, share and transfer information on characterization, propagation and conservation of forest genetic resources with identified gaps.

31. In the past three years, World Agroforestry Centre and NOVELLA project established *Allanblackia circa situ* conservation stands in farmer's fields and developed cost effective propagation protocol for seedling multiplication in Ghana, Tanzania and Cameroon. Information generated from the research is shared through training workshops and publications in scientific journals.

32. A Domestication manual is currently under development which documents methodologies and approaches to assist countries and institutions to identify priorities for action in the context of Agroforestry.

33. To ensure conservation of Tree Genetic Resources, World Agroforestry Center has and continues to contribute to *ex situ* collections at Svalbard and Kunming genebanks.

COOPERATION WITH THE GOVERNING BODY OF THE INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

ACTION GROUP ON EROSION, TECHNOLOGY AND CONCENTRATION (ETC GROUP)

34. The ETC group was the CSO observer to the negotiations that led to the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) and has followed the Governing Body ever since. ETC believes the relationship between the Commission on Genetic Resources for Food and Agriculture (CGRFA), the ITPGRFA, the Global Crop Diversity Trust (GCDT) and the Global Seed Vault should be reviewed to ensure depositor sovereignty over stored Vault accessions. Funding policies for duplicating and transporting accessions to the Vault should also be reviewed. To this end, ETC is working cooperatively with Norway and GCDT to clarify policies and practices.

BIOVERSITY INTERNATIONAL REPORTING ON THE SYSTEM-WIDE GENETIC RESOURCES PROGRAMME (SGRP)

35. The summary of the development of the agreements with the Governing Body of the *International Treaty on Plant Genetic Resources for Food and Agriculture* up to June 2007 is provided in paragraphs 12-16 of the CGIAR report to the 11th Session of the Commission. The 2nd

³ Global Rice Science Partnership.

Session of the Governing Body of the Treaty decided in October 2007 that the Centres should use the Standard Material Transfer Agreement (SMTA) to distribute non-Annex 1 materials acquired before the entry into force of the Treaty. Accordingly, the Centres have been using the SMTA to distribute such materials since February 2008. Details concerning distributions by Centres of both Annex 1 and non-Annex 1 materials are included in reports that were developed, through and on behalf of SGRP, to the 2nd, 3rd and 4th sessions of the Governing Body.⁴ Those reports cover the period from 1 January 2007 to December 31, 2009.

36. The above mentioned reports provide data to the effect that the Centres have been distributing materials using the SMTA for four years, since 1 January 2007. In the first three of those years, from 1 January 2007 to 31 December 2009, the Centres distributed a total of 1.15 million samples of PGRFA. Approximately 84 percent of the samples were sent to developing countries or countries with economies in transition, 9.5 percent to developed countries, and 6.5 percent to other CGIAR Centres. 18 percent were distributed by the Centre genebanks and 82 percent by Centre breeding programmes.

37. The “*Guide for the CGIAR Centres’ use of the Standard Material Transfer Agreement*”⁵ was updated in 2010. The Guide was prepared in consultation with Centres, members of the Executive Committee of the Inter-Centre Working Group on Genetic Resources (ICWG-GR), and members of the Genetic Resources Policy Committee (GRPC) (The GRPC met for the last time in May 2010).

CENTRO AGRONÓMICO TROPICAL DE INVESTIGACIÓN Y ENSEÑANZA (CATIE)

38. A solicitud del Órgano Rector del Tratado Internacional sobre los Recursos Fitogenéticos para la Alimentación y la Agricultura (TIRFAA), el CATIE ha colaborado enviando información oportuna sobre los materiales distribuidos por la institución a los usuarios mediante la utilización del Acuerdo Normalizado de Transferencia de Material (ANTM). También en agosto 2010 se envió la documentación pertinente para que CATIE pueda ser un socio potencial en la participación en los beneficios del Fondo del Tratado Internacional para los Recursos Fitogenéticos para la Alimentación y Agricultura.

39. Es necesaria una mayor difusión en la región de los alcances del Tratado Internacional y de las ventajas del uso del Acuerdo de Normalizado de Trasterferencia de Material a los usuarios de los bancos de germoplasma.

CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

40. In response to a request at the ninth meeting of the Conference of the Parties to the CBD, a study was carried out to examine the relationship between an International Regime on Access and Benefit-sharing, and the IT-PGRFA and the CGRFA.⁶

41. At its tenth meeting, in decision X/1, the Conference of the Parties to the CBD (COP-10) adopted the *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity*. Article 8 of the Nagoya Protocol considers the importance of genetic resources for food and agriculture and their special role for food security. Furthermore, the preamble makes specific reference to the IT-PGRFA and the FAO CGRFA.⁷ The COP also recognized that the objectives of the IT-PGRFA are in harmony

⁴ CGIAR report to the 2nd GB session: <ftp://ftp.fao.org/ag/agp/planttreaty/gb2/gb2i12e.pdf>; CGIAR report to the 3rd GB session: <ftp://ftp.fao.org/ag/agp/planttreaty/gb3/gb3i15e.pdf>; and CGIAR report to the 4th GB session: <http://www.itpgrfa.net/International/sites/default/files/gb4i05e.pdf>

⁵ <http://www.sgrp.cgiar.org/?q=node/668>

⁶ <http://www.cbd.int/doc/meetings/abs/abswg-08/information/abswg-08-abswg-07-inf-03-part1-en.pdf>

⁷ **Recognizing** the interdependence of all countries with regard to genetic resources for food and agriculture as well as their special nature and importance for achieving food security worldwide and for sustainable development of agriculture in the context of poverty alleviation and climate change and acknowledging the fundamental role of the International Treaty on Plant Genetic Resources for Food and Agriculture and the FAO Commission on Genetic Resources for Food and Agriculture in this regard, *Recalling* the Multilateral System of Access and Benefit-sharing established under the International Treaty on Plant Genetic Resources for Food and Agriculture developed in harmony with the Convention.

with the CBD, for sustainable agriculture and food security (preamble to decision X/1),⁸ and noted resolution 18/2009 of the Conference of the FAO on policies and arrangements for access and benefit-sharing for genetic resources for food and agriculture (preamble decision X/1).⁹

42. The Secretariats of the CBD and the IT-PGRFA signed a Memorandum of Understanding to further enhance collaboration in areas of mutual interest within their mandates. The Memorandum foresees, *inter alia*, jointly undertaking workshops, seminars and other events on access and benefit-sharing as well as in other areas. As part of the activities under this agreement, a capacity-building workshop on access and benefit-sharing was jointly organized by the Secretariats of the CBD and the IT-PGRFA in June 2011 and other joint workshops are planned for the next biennium.

INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS (ICARDA)

43. ICARDA has attended along with four other CGIAR centers the 4th session of the Governing Body of the Treaty on Plant Genetic Resources for Food and Agriculture organized in Bali, Indonesia on 14-18 March 2011, and made presentations at three side events including a presentation on “linking conservation to utilization: case of pre-breeding in wheat at ICARDA” in the side event organized by FAO on “Pre-breeding to build capacity for effective use of plant genetic resources”. Dr. Ahmed Amri, Head of Genetic Resources is selected as a member of the panel of experts for the Treaty and participated in the evaluation of proposals submitted under the second call of proposals of the Benefit-sharing fund of the Funding Strategy.

44. Information on ICARDA-genebank accessions is included in paragraphs 117 to 120.

INTERNATIONAL CENTER FOR TROPICAL AGRICULTURE (CIAT)

45. The CIAT genebank materials designated to the multilateral system (MLS) of the Treaty, by 31 December 2010 is as follow: beans (36 249 accessions); cassava (6 592 accessions); tropical forages: (23 140) for a total of 65 981 accessions. CIAT also cooperates with CIP for the safety back-up of an in vitro collection under slow growth, while they keep a copy of the sweet potato collection for them.

46. Using the SMTA of the Treaty, from 1 January to 31 December 2010, CIAT distributed beans (4,506 samples), cassava (450 samples) and forages (1,188 samples) as follows:

- To CIAT programs in 2010: 3,519 samples of beans, 471 samples of cassava, and 50 samples of forages.
- Fifteen countries benefitted from the bean collection in 2010 (Austria, Brazil, Chile, China, Colombia, France, Germany, India, Iran, Italy, Mexico, Pakistan, Spain, Turkey and United States).
- Eight countries benefitted from the cassava collection in 2010 (Saudi Arabia, Colombia, East Timor, Indonesia, Japan, Nigeria, Switzerland and United States).
- Four countries benefitted from the forage collection in 2010 (Colombia, Costa Rica, France and Switzerland).

47. As a result of nine years of work, the cassava collection kept in trust in CIAT (agricultural heritage from 28 countries) has been certified free of diseases of quarantine importance. This is the largest collection in the world in that condition of full availability for cassava. The system of acceptance of the SMTA worked smoothly in 2010, with only one case of non acceptance: the

⁸ **Recognizing** that the objectives of the International Treaty on Plant Genetic Resources for Food and Agriculture are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use, in harmony with the Convention on Biological Diversity, for sustainable agriculture and food security.

⁹ **Noting with appreciation** resolution 18/2009 of the Conference of the Food and Agriculture Organization of the United Nations on policies and arrangements for access and benefit-sharing for genetic resources for food and agriculture.

potential recipient from an extension agency working with dozens of farmers did not want the responsibility of tracking individual SMTAs, and related reporting to the Governing Body.

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

48. ICRISAT has contributed to the report of CGIAR Centres' experience with the implementation of their Agreements with the Treaty's Governing Body, with particular reference to the use of the SMTA for Annex 1 and non-Annex 1 materials. The report covered acquisitions and distribution of germplasm by both genebanks and Centres' breeding programmes for Annex 1 and non-Annex 1 material during the period 1 August 2008 through 31 December 2009, a total of 17 months. Additional information on ICRISAT-genebank collections can be found in paragraphs 19 to 22.

49. Information on ICRISAT-genebank collections is given in paragraphs 17 to 20.

INTERNATIONAL INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT (IIED)

50. IIED works to build a fairer, more sustainable world, using evidence, action and influence in partnership with others. As an independent international research organisation, IIED specialises in linking local to global. In Africa, Asia, Central and South America, the Middle East and the Pacific, IIED works with some of the world's most vulnerable people to ensure they have a say in the policy arenas that most closely affect them — from village councils to international conventions. Through close collaboration with partners at the grassroots, we make our research and advocacy relevant to their needs and alive to their realities (www.iied.org).

51. Over the last 15 years, IIED has worked with local partners to understand how – and under what conditions – can biodiversity important for food and agriculture be conserved and used in an equitable and sustainable manner. Our focus has been on policies, institutions, and practices needed to sustain plant and animal genetic resources in agricultural landscapes, forests, and rangelands.

52. IIED's cooperation with the Governing body of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) led to the official recognition of our work with partners in Peru where agricultural landscapes rich in crop diversity are managed by indigenous communities using local knowledge, institutions and practices (e.g. The Potato Park in Cusco province as a model for the ITPGRFA).

INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA)

53. The International Institute of Tropical Agriculture (IITA) maintains five international collections (± 28000 accessions) of five staple crops: yam, cassava, cowpea, maize and Musa. This germplasm assembled during the last 40 years is distributed worldwide under the multilateral system (MLS) of the International Treaty for Plant Genetic Resources for Food and Agriculture (ITPGRFA). IITA annually reports to the Governing Body of the ITPGRFA on its distribution/acquisition of germplasm to and from recipients/donors.

INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)

54. Cooperation with the ITPGRFA:

- 2009/2010: 249/250 samples were provided free-of-charge from the in-trust collection, benefiting 9/8 countries (including Ethiopia, Kenya, Uganda, Cameroon, China, France, Mali, Turkey, UK, USA, Madagascar, Nepal, Thailand).
- Training in 2009/2010–17 students, fellows and associates from 9 countries (China, USA, UK, India, Kenya, Ethiopia, Germany, Egypt, Uganda) were trained on genebank management, characterization, molecular techniques and plant health.

INTERNATIONAL MAIZE AND WHEAT IMPROVEMENT CENTER (CIMMYT)

55. In the roughly 45 years since its founding, CIMMYT has carefully conserved, studied, and shared a true treasure of humanity: one of the world's premier collections of maize and wheat genetic resources. Wheat holdings comprise some 140,000 accessions of *Triticaceae* seed from more than 100 countries. The maize bank contains 28,000 samples of seed, including the world's largest collection of maize landraces — varieties developed over millennia by farmers in Mexico, the crop's center of origin—along with samples of maize's wild relatives, *Teosinte* and *Tripsacum*, and of improved varieties.

INTERNATIONAL RICE RESEARCH INSTITUTE (IRRI)

56. IRRI recognizes the need for continued cooperation between the Commission and the Governing body. IRRI cooperates closely with the Governing Body as the primary intergovernmental instrument relating to PGRFA. IRRI has attended every session of the Governing Body, has participated in a number of technical advisory groups, and has invested substantial resources in ensuring compliance with both the letter and spirit of the Treaty, as reflected in its updated IPR policy. It has developed the “gold standard” SMTA system and has worked with the Treaty Secretariat on further improvements. It was the first CGIAR Centre to fulfill SMTA obligations on reporting to the Governing Body. It is currently assisting the Secretariat of the Treaty to develop capacity to handle SMTA reports.

SECRETARIAT OF THE PACIFIC COMMUNITY (SPC)

57. The SPC attended the 4th Session of the Governing Body in Bali, providing support to the 6 Pacific representatives. The SPC has worked with the Treaty Secretariat and Bioversity International to review the implementation of the ITPGRFA and the MLS in the Pacific. A document has been produced “State of Play on the Implementation of the ITPGRFA in the Pacific” providing recommendations on how to improve implementation. In addition the Heads of Agriculture and Forestry Services (HOAFS) at their September 2010 meeting endorsed the recommendation that SPC acts as an agent for the Pacific countries, supporting implementation of the ITPGRFA. The Pacific region has submitted two proposals to the recent call from the Benefit-sharing Fund; one proposal was prepared by SPC on behalf of the countries that are Contracting Parties, and was submitted by Fiji.

SOUTH EAST REGIONAL INITIATIVES FOR COMMUNITY EMPOWERMENT (SEARICE)

58. With farmers' concerns in mind, SEARICE has been closely following international discussions related to agricultural biodiversity and PGRFA in particular through the CBD, ITPGRFA and CGFRA where the Philippine-based CSO participate as observer. SEARICE also provides technical support to the Philippine delegation in the CBD and ITPGRFA. SEARICE also actively participated during the 4th Session of the Governing Body of the ITPGRFA in Bali, Indonesia. As an organization working with farming communities and relevant institutions in several countries of Southeast and South Asia and in West Africa, SEARICE has been lobbying within the Treaty for the adoption of agreements and commitments by Contracting Parties to support Farmers' Rights and farmer-based conservation and sustainable use of plant genetic resources.

UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

59. An important subject matter which UNEP is addressing and that has a close link with the work of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) is traditional knowledge (TK). UNEP through the Multilateral Environmental Agreements (MEA's) it administers, in particular the CBD, and through its own programme of work, addresses TK protection and its use for environmental sustainability and well-being. A good example of UNEP's work on TK remains the partnerships it has developed in Biocultural Community Protocols (BCPs) which were show-cased at the CBD Convention of Parties in October 2010. UNEP has in the last two years produced numerous publications intended for advocacy, policy-makers and knowledge base on BCPs

and TK. UNEP is currently working on a publication that looks at the role of MEAs and the law in promoting TK for sustainability.

60. Recently UNEP submitted an application to the ITPGRFA for accreditation as an implementing Agency of the Benefit-sharing Fund (BSF) of the Treaty. A Memorandum for collaboration between UNEP and the ITPGRFA is currently under discussion for operationalization of this partnership.

WORLD AGROFORESTRY CENTRE

Review of cooperation with the International Treaty on Plant Genetic Resources for Food and Agriculture

61. In the past three years, World Agroforestry Centre fully implemented the signing of SMTA documents between international research organizations such as Scottish Crop Research Institute, Siebersdorf, Austria and Kunming genebank when exchanging germplasm.

Cooperation with the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture

62. World Agroforestry Centre recognizes the importance of FAO designated *Sesbania sesban* accessions and all other non-designated collections held at World Agroforestry Centre genebank. As a contracting party, World Agroforestry Centre has signed agreements with the Governing Body in regards to materials held *in-trust* and reaffirms that designated material shall be made readily available for research under SMTA. Amended SMTA documents have been signed in exchanging *Jatropha curcas* germplasm from China, Mexico, India, Tanzania and Uganda.

WORLD INTELLECTUAL PROPERTY ORGANIZATION (WIPO)

63. In 2002, the Secretariat of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) requested WIPO to cooperate with the FAO in the preparation of a study on how intellectual property (IP) rights may affect the availability and use of material from the International Network (of *Ex Situ* Collections under the Auspices of the FAO) and the ITPGRFA. In response to this request, WIPO entered into cooperation with FAO and started developing a patent landscaping report (PLR) on gene promoters relevant to rice. This was completed and published in 2006 (IT/GB-1/06/Inf.17) and shared with the ITPGRFA Member States as a collaboration between FAO and WIPO. The PLR was reviewed in a *Symposium on Public Policy Patent Landscaping in the Life Sciences*¹⁰ organized in cooperation between FAO and WIPO in Geneva on April 7 and 8, 2008.

The ITPGRFA Standard Material Transfer Agreements Dispute Resolution

64. WIPO, through its Arbitration and Mediation Center (WIPO Center), provides technical support to the ITPGRFA Secretariat and the *Ad Hoc* Third Party Beneficiary Committee in developing and implementing complementary options to the current dispute settlement clause in the ITPGRFA Standard Material Transfer Agreement (SMTA).

65. The SMTA dispute settlement clause provides the possibility for a Third Party Beneficiary (designated to be FAO in 2009) to initiate dispute settlement procedures, which can involve negotiation, mediation and arbitration, regarding the rights and obligations of parties to the SMTAs. The framework for this dispute resolution process is recorded in the Third Party Beneficiary Procedures, developed with the technical advice of the WIPO Center, and adopted by the ITPGRFA Governing Body in 2009. Upon the request of the ITPGRFA Governing Body, the WIPO Center in 2010 provided technical assistance in developing draft operational guidelines for the commencement and management of mediation procedures under the Third Party Beneficiary Procedures, and the Rules for Mediation of a Dispute in relation to a Standard Material Transfer Agreement. The ITPGRFA Governing Body adopted these Mediation Rules in March 2011, and requested the WIPO Center to act as Administrator.

¹⁰ http://www.wipo.int/meetings/en/2008/lifesciences/patent_landscaping/

The WIPO Intergovernmental Committee Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC)

66. The ITPGRFA addresses some of the genetic resources/IP issues the WIPO IGC deals with. FAO regularly participates in the IGC (to represent the CGRFA as well as the ITPGRFA).

67. With its comprehensive membership of 184 Member States and over 230 accredited non-governmental organizations (NGOs) and some 70 inter-governmental organizations (IGOs), WIPO is the key forum for discussions on the relationship between IP and Genetic Resources (GRs), Traditional Knowledge (TK) and Traditional Cultural Expressions (TCEs). Established by the WIPO General Assembly (GA) in October 2000 (document WO/GA/26/6), the WIPO IGC is undertaking text-based negotiations with the objective of reaching agreement on a text of an international legal instrument (or instruments) which will ensure the effective protection of TK, TCEs and GRs. WIPO has consulted with a wide range of stakeholders to determine the IP needs and expectations of TK holders.

68. In September 2009, the WIPO GA agreed by consensus to hand the IGC its strongest mandate yet. The new mandate – referring *inter alia* to “text-based negotiations” towards reaching agreement on an international legal instrument (s) which “will ensure the effective protection of GRs, TK and TCEs” – revitalized the substantive work of the IGC and expectations for concrete outcomes are high. The IGC is following a clearly defined work program for the 2010/2011 biennium including four sessions of the IGC and three Intersessional Working Groups (IWGs). Under the new mandate, the IGC is to submit the texts of the international legal instrument to the WIPO GA in September 2011. The Assembly would then decide on convening a Diplomatic Conference.

69. However, the protection of TK, GRs and TCEs raises complex questions for the IP system and many conceptual, policy, technical and operational challenges remain. The IGC remains mindful of closely complementary developments in other forums, including the FAO, the World Trade Organization (WTO), the Convention on Biological Diversity (CBD) and the United Nations Environment Program (UNEP). It is important to note that the current mandate of the IGC expressly recalls that its work shall proceed without prejudice to the work pursued in other *fora*. The IGC continues to build mechanisms that are exceptional for an intergovernmental process to strengthen opportunities for representatives of indigenous peoples and local communities to participate effectively.

70. Regarding TK, the session of the IGC in May (May 9 to 13, 2011) examined *inter alia* a draft text of “Articles” for the protection of TK (document WIPO/GRTKF/IC/18/7). This text was developed by experts who met during the Second Intersessional Working Group (IWG 2) which took place from February 21 to 25, 2011, and worked intensively to craft a text on the protection of TK. The text addresses questions such as a definition of TK, beneficiaries of protection and the scope of rights to be granted in TK and how they would be managed and enforced.

71. Regarding GRs, the IGC is dealing with a range of issues concerning the interplay between IP and GRs and the text-based negotiations underway consider three main areas:

- i. Defensive protection of genetic resources through measures which prevent the grant of patents over genetic resources that do not fulfill the requirements of novelty and non-obviousness: Practical measures taken by WIPO include the creation of improved search tools and classification systems¹¹ for patent examiners when they examine patent applications which claim genetic resources.
- ii. IP aspects of access to genetic resources and equitable benefit-sharing arrangements that govern use of genetic resources:
 1. The IGC commissioned a database¹² to serve as a capacity-building tool and to help inform policy debate. An on-line, publicly accessible and searchable Database on Biodiversity-related Access and Benefit-sharing Agreements was compiled, with a

¹¹ <http://www.wipo.int/classifications/ipc/en/reform/index.html>

¹² <http://www.wipo.int/tk/en/databases/contracts/index.html>

particular emphasis on the IP aspects of such agreements. It has recently been updated at the request of the WIPO IGC. This database provides illustrative examples of the approaches actually taken when reaching mutually agreed terms concerning access and benefit-sharing. It currently contains 39 model and actual agreements from different regions, contractual clauses related to IP and access to genetic resources and search functions by key terms and full text in the contractual clauses.

2. The IGC has also worked on broad principles and draft materials on guidelines for IP aspects of equitable benefit-sharing arrangements, in line with the encouragement of the CBD Conference of the Parties (COP). At the request of the WIPO IGC, an updated version of the existing guidelines on IP aspects of access and equitable benefit-sharing has been prepared by the Secretariat (document WIPO/GRTKF/IC/17/INF/12: *Genetic Resources: Draft Intellectual Property Guidelines for Access and Equitable Benefit-Sharing: Updated Version*).
- iii. Disclosure requirements in patent applications that relate to genetic resources and associated TK used in a claimed invention: At the invitation of the CBD COP, the IGC prepared a technical study on this issue, with input from many WIPO Member States (WIPO publication 786E).¹³ At the invitation of the CBD COP, WIPO also submitted to the CBD COP a report on the “*Interrelation of access to genetic resources and disclosure requirements in applications for intellectual property rights*” (UNEP/CBD/COP/8/INF/7).

72. The Third Intersessional Working Group (IWG 3) on GRs held from February 28 to March 4, 2011 further developed “*Draft Objectives and Principles*” for the protection of GRs and extensively discussed a list of “*Options for future work on IP and GRs*”. Experts from Member States, indigenous and local communities and industry produced a draft text on Objectives and Principles (document WIPO/GRTKF/IC/18/9) for submission to the last session of the WIPO IGC (May 9 to 13, 2011), and Options for future work on IP and Genetic Resources (document WIPO/GRTKF/IC/18/10) including a proposed mandatory disclosure requirement, defensive databases and IP clauses in mutually agreed terms for access and equitable benefit-sharing.

Helping to better understand technology profiles and intellectual property rights of genetic resource based technologies

73. The identification of relevant technologies is essential for effective technology transfer. This is a central challenge in relation to the transfer of genetic resource based technologies. Patent information¹⁴ can make a valuable contribution to food and agriculture development goals. Published patent documents offer a vast, freely accessible source of technological information on which others may build. Patent “landscaping” can also be used, for example, to chart the pace and direction of innovation based in genetic resources. WIPO offers tools and services to enhance access to the relevant technologies through its patent information resources, such as its PATENTSCOPE® portal,¹⁵ which provides up-to-date information on technological developments in fields relevant for FAO (e.g. food security and genetic resources for agriculture, global climate change, etc.). Such tools and services enable WIPO to carry out systematic analyses/landscapes of trends in patenting activity, identification of emerging players, and a breakdown of public and private sector activity, comparative geographical trends, and assessment of freedom to operate in key technologies. These services can be further developed, for example, through the creation of databases of specific genetic resources based technologies, including public domain technologies, and by improving the contents of and access to existing technology databases, both relating to patents and to non-patent literature.

¹³ http://www.wipo.int/export/sites/www/tk/en/publications/technical_study.pdf

¹⁴ http://www.wipo.int/patentscope/en/technology_focus/

¹⁵ <http://www.wipo.int/patentscope/en/>

OTHER PLANT GENETIC RESOURCES RELATED MATTERS

ACTION GROUP ON EROSION, TECHNOLOGY AND CONCENTRATION (ETC GROUP)

74. ETC Group is an international NGO dedicated to the conservation and sustainable advancement of cultural and ecological diversity and human rights. To this end, ETC Group supports socially responsible developments of technologies useful to the poor and marginalized and it addresses international governance issues and corporate power. ETC Group works in partnership with civil society organizations (CSOs) for cooperative and sustainable self-reliance within disadvantaged societies, by providing information and analysis of socioeconomic and technological trends and alternatives. This work requires joint actions in community, regional, and global fora.

75. ETC Group's strength is in the research and analysis of technological information (particularly but not exclusively plant genetic resources, biotechnologies, and [in general] biological diversity), and in the development of strategic options related to the socioeconomic ramifications of new technologies. It works primarily at the global and regional (continental or sub-continental) levels, and maintains offices in Ottawa and Montreal, North Carolina, Mexico City and Davao City, Philippines.

76. The ETC Group (since under its previous name, Rural Advancement Foundation International (RAFI)) has been closely following the deliberations of the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) as well as the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) since their inception.

BIOVERSITY INTERNATIONAL

Other contributions to the MYPOW on plant genetic resources

77. Bioversity International's research on bananas is now included within the new Root and Tuber CGIAR Research Programme (CRP), and the cacao and coconut work is encompassed within CRP 6. Bioversity's Crop Wild Relatives project has now been concluded and a manual is published on the CWR Portal.¹⁶

BIOVERSITY INTERNATIONAL REPORTING ON THE SYSTEM-WIDE GENETIC RESOURCES PROGRAMME (SGRP)

Progress since the Twelfth Regular Session, including Report of the Fifth Session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food And Agriculture

Informatics activities

SINGER

78. The System-wide Information Network for Genetic Resources (SINGER)¹⁷ is a project that dates back to 1994. With financial support from Switzerland and Sweden, Bioversity (then IPGRI), on behalf of the Centres, started the development of an integrated system to facilitate the sharing of and access to genetic resources information relating to the CGIAR collections. Development of SINGER up to 2009 was covered in the CGIAR report to the Twelfth Regular Session of the Commission on Genetic Resources for Food and Agriculture. By that time, the SINGER website had been redeveloped as part of the GPG2 project, benefiting from a new public interface with enhanced functionality, offering a variety of ways to find information, and providing more options for capturing and analysing data, with links to external databases, such as the International Rice Information System (IRIS), hosted by IRRI, or the Crop Genebank Knowledge Base (CGKB).¹⁸

¹⁶ <http://www.cropwildrelatives.org/>

¹⁷ <http://singer.cgiar.org/index.jsp>

¹⁸ <http://cropgenebank.sgrp.cgiar.org/>

79. IBPGR¹⁹ missions collected 225,000 samples of plants varieties. 130,000 samples had passport data published in SINGER. 65,229 samples can be linked to genebank accessions. A major effort has been made to link passport data in SINGER with the information recorded at the time the respective sample was collected. Original documentation from the 558 collecting missions supported by IBPGR was digitally scanned to enable passport information to be extracted, entered into a sample-level database linked to SINGER passport data for accessions originating from the collected samples. This exercise has enabled to publish in SINGER georeferenced passport data for about 130,000 samples upon the 225,000 samples collected. In addition, an online searchable resource provides easy direct access to the full text of the original collecting forms and collecting mission reports as pdf files. 27,000 documents provided by IRRI, AfricaRice and Bioversity were scanned and published on line, in a repository linked to SINGER.

80. In 2010, all Centres provided fully-updated passport data, taking the total number of crop germplasm accessions reported in SINGER from the 11 CGIAR Centres with in-trust collections to 746,711. A technical workshop was held in December 2010 for CGIAR genebank database managers to review lessons learnt from the data-upload exercise and define a sustainable data-sharing mechanism for the SINGER community.

81. The CGIAR report prepared by SGRP for the fourth meeting of the International Treaty's Governing Body in March 2011²⁰ includes an analysis of data on germplasm transfers from all Centres. In conjunction with the Treaty Secretariat, a "shopping cart" based ordering system has been developed allowing users to request germplasm samples from one or more of the CGIAR genebanks via a single request to SINGER. As well as managing the ordering process, the system deals with all necessary legal issues including customer acceptance of the Standard Material Transfer Agreement (SMTA) and disclosure of the planned use of the germplasm. This ordering gateway is now linked to the Treaty's permanent identifier (PID) server, becoming the first multi-provider germplasm ordering platform compliant with the requirements of the International Treaty.

82. An SGRP meeting held in 2009 discussed the future of SINGER in view of the CGIAR change process and the evolving global informatics landscape for genetic resources. As well as addressing issues relating to data quality (including data attribution and citation) information sharing and IT support, the meeting considered the relevance of maintaining a separate SINGER web site once a global information system with a common database is in place (see GENESYS below). This issue will be revisited as the global information system evolves.

GENESYS

83. SINGER has provided invaluable experience and a model to move towards an approach to information management to underpin a global system of plant genetic resources conservation and use. To this end, the Global Crop Diversity Trust and the Secretariat of the International Treaty have supported a project to develop relevant informatics tools. A key tool is GENESYS,²¹ a global informatics portal to provide access to information on around 2.4 million germplasm accessions held in hundreds of genebanks around the world. GENESYS takes the purpose and functionality of SINGER to the next level by incorporating data from genebanks outside the CGIAR System and, as well as passport data, including environmental, characterization and evaluation data for each accession. GENESYS will promote the use of accessions by allowing users to make queries across all categories of data and place orders online.

84. The foundation for GENESYS comprises aggregated data from SINGER, EURISCO²² and the Germplasm Resources Information Network (GRIN)²³ of the United States Department of

¹⁹ International Board for Plant Genetic Resources, the predecessor of IPGRI and Bioversity International.

²⁰ <http://www.itpgrfa.net/International/sites/default/files/gb4i05e.pdf>

²¹ <http://www.genesys-pgr.org>

²² <http://eurisco.ecpgr.org/static/index.html>. EURISCO is a web-based catalogue that provides information about *ex situ* plant collections maintained in more than 40 countries in Europe. SINGER provided the technical infrastructure for EURISCO, as well as training national focal points in the tools and approaches needed to operate the system.

²³ <http://www.ars-grin.gov/>

Agriculture (USDA). Once the portal has been officially launched in March 2011, many other genebanks are expected to participate and provide data. GENESYS looks beyond the CGIAR Centres to the wider community of partners, in line with and supportive of the larger vision behind the ongoing CGIAR change process. Moreover, by providing an informatics portal that is global in scope, GENESYS is favourably positioned as a potential basis for the global information system envisaged by Article 17 of the International Treaty.

GRIN-Global

85. The informatics project noted in paragraph 16 is also supporting the transition of GRIN into a stand-alone genebank management and documentation system – “GRIN-Global”. The system software will be made freely available for ready implementation by any genebank to support the general management and exchange of germplasm accessions and associated information. Bioversity International will coordinate its deployment to interested national partners. It is hoped that the widespread adoption of GRIN-Global by genebanks worldwide will promote the harmonization of genebank data management and facilitate participation in GENESYS. GRIN-Global is due to be launched in early 2011 and is already attracting interest from several CGIAR Centres and national programmes.

Rehabilitation of Global Public Goods Project, Phase 2

86. This USD10.46M World Bank-funded project, entitled in full “*Collective Action for the Rehabilitation of Global Public Goods in the CGIAR Genetic Resources System: Phase 2*” and known as “GPG2”, has been the principle focus of collaborative genetic resources activities among the CGIAR Centres over recent years. As noted in the CGIAR report to the Twelfth Session of the Commission, GPG2 followed on from the preceding “GPG1” project conducted from 2003–2006. GPG2 responded to a recommendation of an external review of GPG1 that the rehabilitation work be continued into a second phase to complete measures to secure the CGIAR in-trust collections, and position the CGIAR to undertake a leading role in designing and implementing a crop-based global system of genetic resources conservation and use.

87. GPG2 had the dual objectives of achieving effective stewardship of the 700,000-plus samples in the Centres' in-trust germplasm collections and providing leadership to partners in developing a global system. The project built upon upgrading activities carried out in GPG1, and completed work required to bring the Centres' infrastructure and operations up to international standards, resulting in a significantly higher capacity in the genebanks. SGRP coordinated GPG2 on behalf of the Centres and saw the project through to successful completion in mid-2010.

88. GPG2 has been a highly successful collective experience that will be an instructive example for collaborative activities within the new CGIAR. Over 150 products were developed within the various activities, covering 20 crops as well as some non crop-specific and non-plant taxa. These achievements took place in the three main areas summarized below, which are then followed by lessons learnt and conclusions and, finally, a description of a main instrument of the project's legacy – the Crop Genebank Knowledge Base (CGKB). Further details of Centre-own and collective activities are presented in Annex I and a full report is available online.²⁴

Key achievements: 1. Improving procedures for managing genetic resources

89. This area of work resulted in the development of best management practices supporting optimum conservation and use of seed and clonal crop collections held in the CGIAR Centres. These best practices, along with training materials and technologies exchanged between Centres, were compiled into a knowledge base (see later section).

90. Products targeted the following areas:²⁵

- *Conservation:* storage procedures for seven seed crops and two clonal crops, with guidelines for medium- and long-term conservation.

²⁴ http://www.sgrp.cgiar.org/sites/default/files/2010_SGRP_GPG2_Final_Report.pdf

²⁵ The products can be located on the following websites: <http://cropgenebank.sgrp.cgiar.org> and <http://www.sgrp.cgiar.org/>

- http://cropgenebank.sgrp.cgiar.org/index.php?option=com_content&view=article&id=238&Itemid=367&lang=english
- *Reducing loss of genetic integrity*: recommendations for reducing and managing the loss of genetic integrity of conserved germplasm.
- *Management of transgenes*: specific guidelines for three crops to maintain conventional germplasm accessions free from transgenic introgression and for conserving germplasm of transgenic crops.
- *Safety duplication*: procedures and model agreements for a System-wide strategy.
- *Inventory management*: model genebank inventory systems and guidelines for bar-coding specifications to assist Centres in implementation.
- *Safe transfer of germplasm*: safe transfer guidelines for 17 crops, including methodologies for pathogen detection and a collaborative platform with recommendations on harmonization of regulatory and phytosanitary requirements of the CGIAR Centres and their host countries.
- *Risk management*: guidelines for risk management procedures including risk assessment and a map of risk mitigation measures to ensure the security, quality and availability of the in-trust germplasm collections with recommendations for linkages to Centre-wide risk management practices.
- *Cost-effectiveness*: methodology and a decision-support tool to enhance the cost-effectiveness of collection management for optimal resource allocation.
- *Improvements in physical infrastructure*: upgrading of the infrastructure at various genebanks resulting in greater overall security of germplasm collections. Seed health testing and monitoring of plant health during regeneration maintained a high level of seed quality for both conservation and distribution purposes.
- *Reducing backlogs*: upgrading and improvements of the Centres' management of the in-trust germplasm collections, in terms of reduced backlogs in the processing of accessions into storage, including regeneration, characterization, health and viability testing, documentation, and safety-duplication.

91. At the outset, it was planned to process 721,594 samples during GPG2. In the event, Centres managed to process 1,232,497 samples (159 percent of the original target) through additional tasks being accomplished by the Centre genebanks, subjecting individual accessions among the total genebank holdings to multiple processes to enhance their quality and security of conservation. Whilst 170,964 samples were planned to be processed through safety duplication, the Centres actually processed 406,748 (238 percent of the original target) with about one third being sent to the Svalbard Global Seed Vault in Norway, and two thirds safety duplicated at various other host institutions.

Key achievements: 2. Increasing the value and use of the collections

92. This area of work focused on understanding the diversity in the in-trust germplasm collections and filling priority gaps, optimizing the quality of data relating to accessions in the collections, and enhancing user access to the in-trust collections and related information.

93. Products targeted the following areas:²⁶

- *Diversity research*: existing phenotypic characterization strategies on selected CGIAR mandate crops (chickpea, rice, maize, potato, *Musa*, pigeonpea, sorghum) and patterns of demand for trait-specific germplasm reviewed to determine potential value and usefulness across Centres.
- *Ecogeographic gaps*: georeferenced data checked and an analysis protocol for identifying basic ecogeographic gaps in the diversity of wild species and cultivated materials applied to wild species from 10 genebanks.

²⁶ The products can be located on the following websites: <http://cropgenebank.sgrp.cgiar.org> and <http://www.sgrp.cgiar.org/>

- *Improvement of location data quality*: many missing data and errors corrected in databases.
- *Crop register templates*: jointly developed for crops in common.
- *Central repository*: holding more than 120,000 scanned passport data records from collecting missions.
- *One-stop entry point*: a germplasm-ordering system prototype using SINGER data and a help-desk to support implementation by Centres.

Key achievement: 3. Planning for the future

94. The particular strength of the GPG2 project was the way that it built on a foundation of individual Centre competence to develop new modalities of collaboration for the integration and sharing of standards and methodologies across genebanks. The aim was to increase System-wide efficiency and effectiveness in the management and accessibility of crops, particularly those held in common among Centres. This was accomplished through the development of common information systems, the identification of duplicates among Centre collections, and the sharing of tasks in conserving and distributing material. Effective collaboration among the Centres provided a springboard for the CGIAR to take leadership in the development of a more effective and efficient global crop-based conservation and use system.

95. The elements that will allow the CGIAR to continue to provide a stream of public goods and exert leadership include:²⁷

- *A draft sustainability plan*: to ensure a lasting result from the investment in rehabilitation of the collections and support Centres' in fulfilling their in-trust commitments in the future.
- *A strategic plan for enhancing CGIAR System capacity*: to identify and address research priorities for collective action.
- *A plan for engaging and retaining skilled human capacity in the System*: directly linked to the development of the sustainability plan, including staffing recommendations for Centre management.
- *Strategies for neglected and underutilized plant species in the CGIAR and in national genebanks*: prioritizing groups of species, determining areas of relevance for model development, providing communities with guidelines for assessing benefits, and identifying research suitable for collective action and consistent with Centres' comparative advantage.
- *Strategies for non-plant taxa in the CGIAR System and national genebanks*: including bacteria, fungi, oomycetes, viruses, insects and nematodes.
- *Strategies for genetic stocks*: documenting survey results and listing existing and future genetic stock collections for all major crops.
- *A set of performance indicators*: to assess the CGIAR Centres' management of the in-trust germplasm collections.
- *A policy analysis of the elements of an integrated global system*: with country report analyses from Peru, Morocco, Kenya and Philippines, and a cross-cutting analysis of common features.
- *Guidelines on quality management for genebanks*: with a feasibility study on the use of ISO standards for genebanks.

Lessons learnt and conclusions

96. As a significant body of work based largely on collective action revolving around the SGRP's avowed strength in managing partnerships, reflection on the GPG2 experience provided a valuable opportunity identify what worked well and what could be improved for future collective action projects, as well as maximizing the impact of GPG2 itself.

²⁷ The products can be located on the following websites: <http://cropgenebank.sgrp.cgiar.org> and <http://www.sgrp.cgiar.org/>

97. The design and management of future projects would benefit from aggregation of similar activities into larger units to streamline reporting requirements. Planning should allow adequate time at the beginning of the project for start-up activities and team building, with due regard to the interdependency of different project activities to allow time for sequential delivery of outputs. Budgeting should make due allowance for the transaction costs entailed in complex collaborations.
98. Balance is required to ensure good communication among partners in such a complex project, whilst avoiding information overload, along with appropriate use of diverse media, direct communication and personal interactions whenever possible, and identification of Centre champions to support communication and information sharing.
99. Creative use of knowledge-sharing mechanisms supported and expedited the dissemination of the GPG2 products. Attribution of sources was identified as having a key role in collaborative work and for products of collective action made available as global public goods. GPG2 applied guidelines on source attribution for information sharing using social media.
100. GPG2's products will have a useful life considerably beyond the duration of the project, requiring efforts to promote and disseminate them over time, as well as the need for continued support from the Centres to ensure that the more dynamic products are developed and updated as necessary to remain relevant. Similarly, since it was not possible to test or validate all products during the life of the project, with some still being internalized into genebank operations, there is an ongoing learning experience that would justify nurturing the community of practice built up through the project.

The Crop Genebank Knowledge Base (CGKB)

101. CGKB²⁸ is a crucial product of GPG2 at the same time as being the mechanism for accessing other GPG2 products. As the first online resource for genebank managers and conservationists, CGKB offers a single entry point source of crop-specific knowledge and best practices for germplasm management, plus a vast collection of publications. These resources provide information on general conservation procedures for genebanks, plus a wealth of information on germplasm management strategies including, for example, decision support tools, maintenance of genetic integrity, performance indicators, policies and legal instruments, quality control and risk management, and safe transfer of germplasm and other specialized materials.
102. The crop-specific information has been compiled by genebank experts in the CGIAR Centre and national genebanks world-wide, and has been peer-reviewed by crop specialists. It includes detailed treatment of nine crops (banana, barley, cassava, chickpea, forage grasses and legumes, maize, rice and wheat) guiding the user through all steps of their conservation in a genebank. In addition, specific regeneration guidelines are provided for 22 crops.
103. As well as serving the needs of genebank practitioners, the CGKB represents a one-stop library for a wider community of users, providing access to an extensive selection of publications, guidebooks, training manuals, photos, videos, a glossary, and other learning resources. Multimedia tools available on CGKB include flipbooks, video clips and images, along with a Flickr photostream and a YouTube channel.
104. Participation and communication among users are actively encouraged through collaboration tools such as a Wiki, comment boxes, a blog, and an online forum for curators and conservationists to upload contributions to crop-specific best practices. Indeed, contributors and collaborators from the genebank community and beyond are welcomed to help enrich and expand CGKB through, for example, providing information on best practices for additional crops, new management procedures, protocols for techniques such as cryopreservation, descriptor lists and help with translation of CGKB into other languages.
105. The CGKB website was officially launched in December 2010 and has been very well received. Visits to the site are growing, with the January 2011 data recording 5400 visits from nearly all countries in the world. Examples of ongoing and planned activities to continually enrich CGKB

²⁸ <http://cropgenebank.sgrp.cgiar.org/>

include translation of the website into Spanish with support from CIMMYT and CIP, updating the 1995 publication “*Collecting plant genetic diversity: technical guidelines*” (edited by Luigi Guarino, V. Ramanatha Rao and Robert Reid) using the CGKB Wiki, and addition of procedures for developing core collections in collaboration with USDA.

Contributions to Updated Genebank Standards

106. At the 12th Regular Session of the Commission on Genetic Resources for Food and Agriculture (CGRFA-12), the Commission requested that the FAO/IPGRI Genebank Standards, which were published in 1994, be revised to reflect significant advances in the field of science and technology and recent changes in the global policy landscape.

107. The main policy developments that concern the conservation of plant genetic resources in genebanks relate to impact on the availability and distribution of germplasm arising from the adoption of international instruments such as the CBD, the International Treaty and the International Plant Protection Convention (IPPC). On the scientific front, advances in seed storage technology, biotechnology, and information and communication technology (ICT), have added new dimensions to plant germplasm conservation in terms of opportunities, options and efficiencies.

108. The process of reviewing and updating the 1994 Genebank Standards is well-advanced under the coordination of Bioversity International on behalf of the CGIAR, with the participation of experts from other CGIAR Centres and numerous other national, regional and international partners worldwide. The proposed scope of the updated version is derived from the outcome of an Expert Meeting that was held at Bioversity in Rome, 6-8 September 2010. Through a process that included several such meetings, email surveys and other written inputs, a first consolidated draft of the updated genebank standards was produced in February 2010. The draft was considered at the 4th Governing Body meeting of the ITPGRFA in March 2011 and subsequently at the 5th session of the Inter-Governmental Technical Working Group on PGRFA of the Commission in April 2011. Inputs received from members were considered and an improved draft was prepared, but was not discussed at the 5th Session of the ITWG-PGR due to lack of time. The improved draft will be submitted to the Commission for further guidance.

FRIDTJOF NANSEN INSTITUTE (FNI)

109. The Fridtjof Nansen Institute (FNI) is an independent foundation engaged in research on international environmental, energy and resource management politics. One of the central research areas is international agreements on conservation and sustainable use of biodiversity and fair distribution of benefits derived from the utilization of genetic resources.

110. FNI research is aimed at processes with ramifications for the national implementation of international agreements on biodiversity, including interaction with international agreements on trade and agriculture. Central research topics are access and benefit sharing, farmers' rights, seed laws, and intellectual property rights and their consequences for the conservation and sustainable use of biodiversity. Research covers the management of domesticated as well as wild biodiversity, including the genetic resources of plants and animals for food and agriculture, aquaculture, forest biodiversity, and other genetic resources in the wild. The research team comprises six experts, covering political science, law, biology, and development studies, and collaborating with partners in Norway as well as internationally.

Selected ongoing projects

111. The Farmers' Rights Project is aimed at supporting the implementation of Farmers' Rights, as they are recognized in the ITPGRFA, with research based guidance. The identification of achievements, barriers, options, and success stories constitute core activities, along with dissemination activities, such as a website developed as a tool for decision makers, practitioners and others (www.farmersrights.org), and the facilitation of international processes, such as the Global Consultations on Farmers' Rights in 2010. Starting in 2005, it is a long term project with many different components and partners.

112. The project ‘Norwegian Biodiversity Policy in the Interface between European Legislation and Multilateral Environmental Treaties: the Seed Issue’ identifies matches and mismatches between EU regulations on variety release and seed distribution, and the CBD and ITPGRFA, and explains the findings by analyzing driving forces, interests, power sources, strategies and impact. Finally, the room of maneuver and options available will be identified.

Some important past projects

113. The project ‘Governing Agrobiodiversity – Inter-Regime Conflicts on Plant Genetics and Developing Countries’ took the CBD, ITPGRFA, TRIPs Agreement, and UPOV as points of departure for a comprehensive analysis of how these international agreements affect the management of crop genetic resources in developing countries.

114. The project ‘Evaluation of Need for Legislation on Access and Rights to Forest Genetic Resources in the Nordic Region’ was aimed at clarifying whether it is necessary and possible to take legal steps to ensure that forest genetic resources remain under a viable public domain and open exchange system.

115. Dissemination activities are central components of all projects. Information about books, articles, reports, websites, side-events, presentations, etc., is available at: www.fni.no

**INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS
(ICARDA)**

Summary of major achievements during 1 January, 2010- 30 April 2011

Introduction

116. ICARDA plays a crucial role in promoting *in situ* and *ex situ* conservation and sustainable use of dryland agrobiodiversity and in working towards the development of a reliable Global System for conservation of plant and animal genetic resources. ICARDA’s contribution to the 13th Regular Session of the Commission on Genetic Resources for Food and Agriculture highlights the organization’s major achievements for the period of January 2010 to end of April 2011.

Conservation and utilization of plant genetic resources

117. ICARDA-genebank holds more than 135,069 plant accessions belonging to more than 580 species of cereals, legumes and range species, as of 30 April 2011. A total of 1193 new accessions were added to the genebank holdings, including 586 accessions from 5 collecting missions in Jordan, Libya, Syria and Tajikistan and 567 accessions of elite germplasm received from breeders at ICARDA. In 2010, the collecting missions to Georgia and Armenia allowed to collect 1224 seed accessions and around 600 herbaria samples, not yet processed into the genebank. Overall 89% of ICARDA holdings are characterized for major morphological descriptors and 32,823 accessions were characterized since January 2010. A total of 102,114 accessions are already safely duplicated at Svalbard Seed Vault including 71,475 accessions sent since January 2010. ICARDA has established 165 isolation cages which are allowing the regeneration of more than 600 accessions of cross-pollinated species, annually.

118. ICARDA-Genebank has distributed more than 9797 accessions to more than 90 collaborators in 28 countries, in addition to 17,000 accessions supplied to researchers within ICARDA. The sets supplied were selected using the newly developed approach of Focused Identification of Germplasm Strategy (FIGS) which allows to selecting the best bet sets for sought traits. More than 16,000 accessions were evaluated for resistance to diseases (yellow rust in case of wheat and for cold tolerance in case of food and feed legumes) by the Genetic Resources Section (GRS). Around 1200 accessions of *Lathyrus* species were evaluated for the neurotoxin ODAP-content and 100 landraces of *Pisum* were evaluated for forage production and quality.

119. More than 500 interspecific and intergeneric crosses followed by backcrosses were made to transfer genes of resistance to diseases/insects and tolerance to major abiotic stresses from wild *Triticum* and *Aegilops* species into durum and bread wheat. Pre-breeding efforts have led to the transfer of new sources of resistance to Hessian fly, Russian Wheat Aphid, Septoria, rusts in wheat

and allowed the selection of parental lines showing more tolerance to drought than the recurrent parents. Interspecific crosses with distant wild relative species are initiated in case of chickpea, lentil and grass pea.

120. ICARDA holds around 1383 accessions of *Rhizobium* strains and has distributed around 32 samples to 3 collaborators. It also maintains in good order 13,500 herbarium samples of its mandated species with around 1800 mounted to be added into the database.

Promoting in situ/on-farm conservation of dryland agrobiodiversity

121. ICARDA continues to promote *in situ*/on-farm conservation of dryland agrobiodiversity through several activities including those of the Diversification and Sustainable Intensification of Production Systems, and Integrated Water and Land Management Programs.

122. ICARDA-GRS has conducted the ecogeographic and botanical surveys to monitor the biodiversity of crops and fruit trees wild relatives and their threats in 32 monitoring sites in Jordan, Lebanon and Syria. In 2010, *Allium* wild species distribution and diversity was assessed in parts of Syria by a Tajik expert supported by FAO and 18 different species were recorded. ICARDA is providing technical backstopping for the Rainfed Agriculture and Livestock project funded by the World Bank in Yemen for promoting the on-farm conservation and informal seed production and supply of 32 landraces of cereals and legumes in five provinces. Expertise is provided to the Palestinian Agricultural Research Center on promoting on-farm conservation of landraces of cereals and legumes.

123. In 2010, ICARDA has approved its research strategy on horticultural species and in 2011, a joint research is undertaken with CIRAD-France to assess the diversity and its determinants for dryland fruit trees (olive, fig, almond, etc) in Syria.

Technical backstopping and capacity development

124. On plant genetic resources, seven group training courses (4 headquarters and 3 in-country courses) were conducted since January 2010 which benefited a total of 92 participants including 52 on best practices for conservation and utilization of genetic resources, 23 on *in situ* and on-farm conservation of dryland agrobiodiversity, and 17 persons benefited from individual courses on use of DNA molecular techniques and on documentation. In addition, 9 BSc. 3 MSc. and 3 PhD students have conducted their thesis work on genetic diversity analysis of various crops at ICARDA-GRS.

125. ICARDA-GRS provided needed technical backstopping on best practices for collecting and conserving genetic resources to the genebanks in Morocco, Libya, Tunisia, Syria, Oman and Yemen. ICARDA-GRS participated in the panels of experts for the establishment of genebanks in the United Arab Emirates, Qatar and Oman and developed joint proposals with Kuwait, Iraq and Palestine for genetic resources conservation. Technical expertise was also provided on on-farm conservation to Yemen. ICARDA-GRS conducted a preliminary assessment of genetic resources conservation activities in Morocco, Libya, Syria, Jordan, Yemen, Oman, Tunisia, Georgia and Tajikistan and made proposals for improvement of the handling of accessions.

Contribution to Genetic Resources Scoping and Costing studies

126. ICARDA contributed to the development of the Consortium Research Programs (CRPs) and included most activities related to conservation and sustainable use of dryland agrobiodiversity in different CRPs. ICARDA has also contributed to the scoping study on genetic resources and the costing study of the CG genebanks. Both studies stressed the importance of conserving and using genetic resources and of maintaining the Inter-Center collaboration to sustain the cross-cutting issues through the strengthening of the ICWG-GR and the GRPC to build up on the created momentum. While the centers welcomed the results of the costing study, a revision is needed to include the activities not considered in the study and to take into account the specificity of some activities as in the case of *Rhizobium* collection and the special handling of large number of cross-pollinated species maintained by ICARDA.

127. *Contribution to strengthening the regional networking and the Global System on conservation of genetic resources*

- Contribution to SGRP and ICWG-GR activities: ICARDA contributed to all activities of the Global Public Good project 2 (achievements detailed in the report submitted to FAO by Bioversity International reporting on the SGRP of the CGIAR). It has coordinated the development of crop registers for crops in common, developed in collaboration with other CGIAR centers the best practices for conservation of barley, wheat, fababeans, lentil, forages and the seed health requirements, and to promoting the development of GENESYS and GRIN-Global genetic resources databases and programs. It has participated in all meetings held by the System-wide Genetic Resources Program (SGRP) and ICWG-GR which allowed among others the development of biodiversity performance indicators.
- Strengthening PGRFA regional networks: ICARDA is a member of the AARINENA-PGR network,²⁹ responsible for the aspects related to the conservation of genetic resources. ICARDA organized with AARINENA a meeting of the national focal points on 04 November 2010 to discuss future collaborative activities. ICARDA continues to play an important role along with Bioversity International in the Caucasus and Central Asia Plant Genetic Resources Network (CACPGR).
- Collaboration with the ITPGRFA (see paragraph 43)
- Collaboration with FAO: Dr. Amri participated in the expert meeting to revise and update the Genebank Standards (IPGRI/FAO 1994 report).

INTERNATIONAL CENTER FOR TROPICAL AGRICULTURE (CIAT)

128. In order to increase the availability of international public goods, namely technical information for genebanks of national programs, CIAT has continued with the updating of GPG2 products such handbooks of procedures, best practices, etc. Such products can be downloaded at no cost from the CIAT website, and from the SGRP website. Availability of data from former evaluation work was increased during 2010, namely for the bean collection, including date of flowering, maturity, reaction to the Bean Common Mosaic Virus (BCMV), and bruchids. A final GPG2 workshop on best practices for both medium term and long-term conservation of clonal crops was organized in February 2010 together with Bioversity, CIAT, the International Potato Center (CIP) and IITA. Another achievement coming out of the GPG2 project, even if still work in progress, has been the cassava common registry, in collaboration with IITA, where CIAT benefitted a lot from the previous experience of ICARDA, and the forage registry with ILRI.

129. CIAT is also cooperating with many countries and supported by the Global Crop Diversity Trust, with backstopping of the Bioversity America's Regional Office, in the work to save unique *ex situ* collections:

- Beans: Costa Rica, Myanmar, Peru, University of Puerto Rico, Dominican Republic and Haiti.
- Cassava: Malaysia and Peru.

130. Some work is also done on *in situ* conservation with the University of Costa Rica and with the University of Guadalajara, Mexico.

131. During the last reporting period, CIAT was also engaged in training in seed conservation (drying, seed purity, long-term conservation, viability testing - Brazil and Colombia (14 people)); in germplasm health testing (detection of fungi, bacteria and viruses of quarantine importance - Brazil (7)); in germplasm quality (characterization, integrity, genetic drift - Colombia (1)); and on *in vitro* techniques and management of an *in vitro* genebank - Colombia (6), Brazil (7), Ecuador (1).

132. CIAT Genebank manager, Daniel Debouck presented a paper on the occasion of the 6th Henry A. Wallace Conference "Agrobiodiversity in Mesoamerica: from genes to landscape", held at

²⁹ Association of Agricultural Research Institutions in the Near East and North Africa - Plant Genetic Resources network

CATIE, Costa Rica, September 2010 (D.G. Debouck, J. Salcedo and N.P. Castañeda. 2010. Status of conservation and use of Phaseolus beans genetic resources in Mesoamerica: a few examples).

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (IDRC)

133. IDRC initiatives that deal specifically with issues related to plant genetic resources include projects funded under the Canadian International Development Research Fund (CIFSRF) - a CA\$62 million joint initiative between IDRC and the Canadian International Development Agency, and a key component of the Government of Canada's Food Security Strategy.

134. For example, in South Asia, despite being nutritious, highly storable, and tolerant to adverse conditions, small millets have been neglected in agricultural policy in favour of major cereals and cash crops. IDRC is funding research to support small holder farmers and indigenous groups in developing improved cultivars of millets, in reviving village-based seed systems, and in applying sustainable practices that build resilience to climate, disease and pests. The major objective is to document and test on-farm conservation of agro-biodiversity and increase production and consumption of small millets, pulses, and oil seeds in India, Nepal and Sri Lanka.

135. In Nigeria, indigenous vegetables are extremely important to poor rural women. Women also comprise more than 50% of the rural labour force, a number that is likely to increase. New technologies are needed, therefore, to improve farming and smallholder agricultural practices. IDRC supported research looks at underutilized and under-exploited vegetables to assess their nutritional content, drought tolerance and resistance to diseases, and thus their potential to enhance food security, value-addition, economic growth and conservation of high-premium species. The goal is to provide tools for production, processing, use, and marketing of underutilized vegetables.

136. In Peru, organic agriculture is promoted as a sustainable way to increase overall farm performance, build resilient farming systems, reduce poverty, and improve food security. IDRC is supporting research on Andean seed and crops including germplasm management, organic farming techniques, participatory plant breeding, and nutrition. The research aims to increase food security of smallholder farmers in Peru through better conservation and management of Andean roots and tuber crops and promoting highly nutritious indigenous vegetables.

INTERNATIONAL MAIZE AND WHEAT IMPROVEMENT CENTER (CIMMYT)

GRIN-Global

137. CIMMYT has embarked to fully implement GRIN-Global as its sole germplasm bank inventory management system. The transition to this new system is anticipated to be completed by the end of 2011, and will require complete, active compatibility and synchrony with the IT ICIS system used by other researchers and breeders at CIMMYT. Interoperability with SINGER and GeneSys will also be required.

INTERNATIONAL RICE RESEARCH INSTITUTE (IRRI)

138. IRRI's mission is "to reduce poverty and hunger, improve the health of rice farmers and consumers, and ensure environmental sustainability through collaborative research, partnerships, and the strengthening of national agricultural research and extension systems."

The conservation and sustainable use of rice genetic resources is a prerequisite to achieving this mission and therefore fundamental to IRRI's programmes. In 1994, IRRI placed a collection of designated rice germplasm under the auspices of the FAO as part of the international network of *ex situ* collections, holding it in trust for the benefit of the international community. In 2007 the collection was placed within the purview of the Treaty.

139. In 2011, IRRI launched the Global rice Science Partnership ("GriSP"), a technical and scientific R&D partnership involving some 900 partners globally. It represents, for the first time ever, a single strategic and work plan for global rice research, integrating the entire impact pathway from conserving and using genetic resources to sustainably improving livelihoods. It has six themes:

1. Harnessing genetic diversity to chart new productivity, quality and health horizons.
2. Accelerating the development, delivery and adoption of improved rice varieties.
3. Ecological and sustainable management of rice-based production systems.
4. Extracting more value from rice harvests through improved quality, processing, market systems and new products.
5. Technology evaluation, targeting and policy options for enhanced impact.
6. Supporting the growth of the global rice sector.

140. Within Theme 1, Product Line 1.1 is “*ex situ*” conservation and dissemination of rice germplasm”, and explicitly recognizes the important roles of the Commission and the Treaty. The remainder of Theme 1 deals with improving knowledge of rice genetic resources, including, under theme 3, *in situ* conservation in resilient productive farming systems.

SOUTH EAST ASIA REGIONAL INITIATIVES FOR COMMUNITY EMPOWERMENT (SEARICE)

141. Central to the work of the South East Asia Regional Initiatives for Community Empowerment (SEARICE) are the men and women farmers who continuously engage in the conservation, development and sustainable use of PGRFA. SEARICE provides spaces for farmers, to assess their situations, and question socio-economic and environmental disorders, so that by themselves, they become propelling forces to shape policies and political agenda’s. On the basis of their experiences on the ground, farmers become their own advocates for increased agricultural biodiversity. SEARICE brings about these revolutionary changes primarily through Farmers’ Field Schools (FFS).

142. The FFS provides intensive lessons to farmers on *in situ* conservation of PGRFA. Consequently, farmers increase agricultural biodiversity by producing a diverse collection of farmer-bred varieties; and managing community seedbanks that provide easy access to viable breeding materials.

143. One of the goals of the CGRFA is to reach international consensus on policies and action programmes to ensure the conservation and sustainable utilization of genetic resources for food and agriculture, as well the fair and equitable sharing of benefits derived from their use. CGRFA offers a permanent forum where members work to spur policy efforts related to biodiversity for food and agriculture, such as the ITPGRFA. We strongly feel that in the course of reaching this goal, attention must be given to the vital role of our food producers or farmers/peasants. We believe that the Commission will be able to focus on the following issues and concerns of small farming communities during its meeting on 18 – 22 July 2011:

Breathe Life to Farmers’ Rights in ITPGRFA

144. The Treaty’s recognition of the international dimension of Farmers’ Rights needs translation into action. The implementation of Farmers’ Rights cannot be left at the behest of national governments, but must find compelling mechanisms in international policies.

For starters, activities for implementing farmers’ rights need regular funding. Funding mechanisms for *in situ* conservation must be established to allow direct access to funds under the Treaty by small-scale farmers engaged in conservation, development and sustainable use of PGRFA.

Adopt Voluntary Guidelines on the Implementation of Farmers Rights

145. The Commission can call for the adoption of Voluntary Guidelines on the implementation of Farmers’ Rights. This will be similar to the set of guidelines successfully adopted by the FAO on the Right to Food.

Global Report on State of Farmers’ Rights

146. The Commission can strongly facilitate the publication of a periodic State of the World’s Farmers Report with the active participation of farmers.

2.2 Aquatic genetic resources

REVIEW OF INFORMATION BASE FOR AQUATIC GENETIC RESOURCES, AND KEY ISSUES FOR THE STATE OF THE WORLD'S AQUATIC GENETIC RESOURCES

CAB INTERNATIONAL (CABI)

147. CABI maintains a series of information compendia which includes information on genetic resources useful to agriculture and food. For example, the Aquaculture Compendium is a global database of over 700 datasheets including detailed information on 300+ cultured aquatic species and 100 aquatic diseases and disorders. There is summary information on 200 other diseases and overview datasheets on production and environmental systems, and wide-ranging issues in aquaculture. There is also an electronic library of specially commissioned and previously published information, including case studies – featuring 1000 items from internationally respected sources plus a bibliographic database with over 80,000 records and over 2,000 images to allow for easy identification and teaching. There is an interactive glossary, with more than 30,000 definitions. Other, similarly structured, compendia deal with Forestry and Crop Pests (and their natural enemies).

CENTRO AGRONÓMICO TROPICAL DE INVESTIGACIÓN Y ENSEÑANZA (CATIE)

148. CATIE no conserva ni utiliza recursos genéticos acuáticos

FRIDTJOF NANSEN INSTITUTE (FNI) (see paragraphs 158 and 243)

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (IDRC)

149. In Bolivia, although fish could be the main source of protein in the region, it is often not part of the diet of populations that produce it. IDRC is supporting research to capitalize on the under-utilized fish resources of the northern Bolivian Amazon to improve food security and increase livelihood options for the most vulnerable. The research will address small-scale aquaculture and fisheries development and will provide a model for comparable development in other parts of the country.

INTERNATIONAL RICE RESEARCH INSTITUTE (IRRI)

150. Besides “aquatic” rice and wild relatives, IRRI’s involvement in aquatic genetic resources is minor. It maintains a collection of the N-fixing aquatic fern *Azolla*. Through collaborative projects on rice/fish and rice/shrimp farming systems, there is the possibility of involvement in aquatic animal genetic resources.

SECRETARIAT OF THE PACIFIC COMMUNITY (SPC)

151. Inland aquaculture is being given priority by SPC members as one of the strategies to address a projected Pacific “Fish Gap” due to population growth and to effects of climate change on coral reef fisheries, but scientific research to formulate policy advice is urgently needed regarding use of improved varieties of freshwater fish in aquaculture and their translocation/introduction beyond their present ranges, to resolve “incoherence” in international dialogues regarding Food Security vs. Biodiversity.

2.3 Application and integration of biotechnologies in the conservation and utilization of genetic resources for food and agriculture

ACTION GROUP ON EROSION, TECHNOLOGY AND CONCENTRATION (ETC GROUP)

152. The ETC Group closely follows the rapid pace of meta-genomics research and notes the serious implications of current developments on the future of genetic resources conservation and utilization. It is already possible to map a human genome in approximately 10 days for \$5000, some industry sources believe it will be possible within two years to map the genome of any species for a

few hundred dollars in 15 minutes, and the new hyperspectral imaging technologies are making remote rapid biological diversity appraisal inexpensive. Already, so-called digital DNA genomes are being regularly uploaded to the Internet and that synthetic biology makes it practicable to download digital genome maps or gene sequences and, with gene synthesis machinery, construct artificial sequences circumventing SMTAs and any known capacity to prohibit biopiracy.

153. In view of these rapid developments that might make the Treaty and any access and benefit sharing agreements obsolete in the near future, the ETC Group proposes that the CGRFA explore these implications on the conservation and utilization of genetic resources for food and agriculture.

BIOVERSITY INTERNATIONAL REPORTING ON THE SYSTEM-WIDE GENETIC RESOURCES PROGRAMME (SGRP)

154. Issues that cut across the different sectors of agricultural biodiversity have long been a feature of the CGIAR's work and are becoming increasingly prominent as the Centres become progressively more involved in ecosystem approaches and in work that is applicable to multiple sectors.

155. Through collaboration between SGRP and the Genetic Resources Policy Committee (GRPC), a third edition of the "Booklet of CGIAR Centre policy instruments, guidelines and statements on genetic resources, biotechnology and intellectual property rights" was produced in 2010. This includes policy instruments and guidelines related to the management of PGRFA under the framework of the International Treaty. The booklet is available online.³⁰

CAB INTERNATIONAL (CABI) (see paragraph 216)

CENTRO AGRONÓMICO TROPICAL DE INVESTIGACIÓN Y ENSEÑANZA (CATIE)

156. CATIE conserva un duplicado *in vitro* de sus colecciones de raíces y tubérculos. Las colecciones de yuca y ñame han sido regeneradas de forma parcial y total respectivamente. Además se enviará un duplicado de seguridad de estas colecciones al CIAT e IITA respectivamente. Por otra parte, la core collection de café (*Coffea arabica*) se encuentra duplicada en nitrógeno líquido. Esta estrategia de conservación corresponde al primer criobanco de semillas de café en Latinoamérica.

CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

158. CBD COP-10, in its consideration of new and emerging issues, in decision X/13, para. 4, invited the submission of information on synthetic biology for the consideration by the SBSTTA while applying the precautionary approach to the field release of synthetic life, cell or genome into the environment.

FRIDTJOF NANSEN INSTITUTE (FNI)

Selected ongoing project

158. The project 'Developing and Implementing Advanced Molecular Methods, and Streamlining Access to and Use of Aquaculture Genetic Resources: Carp and Shrimp in India' (carried out with NOFIMA) develops and implements a new marker assisted selective breeding technology that can be used to select for improved disease resistance and provides solutions on how the created genetic resources and intellectual property can be best accessed and distributed to facilitate aquaculture development in India.

³⁰ <http://www.sgrp.cgiar.org/?q=node/1053>

INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS (ICARDA)

Summary of major achievements during 1 January, 2010- 30 April 2011

Contribution to characterization and sustainable utilization of small ruminant genetic resources

159. ICARDA has continued documentation and characterization of small ruminant genetic resources in the non-tropical dry areas with national programmes. Countrywide surveys to characterize production systems and populations of sheep and goat in Libya and of goats in Syria and a goat characterization study in Amhara region in Ethiopia have been conducted.

160. Special emphasis is given to characterizing adaptive traits of local/indigenous genetic resources to harsh climates. To this end, ICARDA is conducting a pilot study with national partners and FAO on production environment descriptors for local sheep and goat breeds in Morocco, Egypt, Turkey and Iran. ARC Egypt and ICARDA are studying genetic markers for heat tolerance in Egyptian desert sheep and goats.

161. The main emphasis of ICARDA's work is on sustainable utilization of sheep and goat genetic resources in the context of range-crop-livestock production systems. To support sustainable utilization of local genetic resources, ICARDA is developing with advanced Research Institutions (ARI) and NARS community based breeding programs for indigenous sheep and goat breeds in Ethiopia, Tajikistan and Iran based on the demands and opportunities of poor livestock keepers. ICARDA also organized an expert meeting in Vienna to review the state of the art and identify research priorities in community-based breeding programs.

162. ICARDA and the Agricultural Research Centre (ARC) Libya have also recently published a field guide on phenotypic and molecular characterization of small ruminant breeds in Libya. With text in Arabic and English, the guide is intended to support animal scientists and technicians in collecting accurate data and applying appropriate procedures in field surveys.

See <http://www.icarda.org/docrep/brochures/phenotypic.pdf>

163. For information on ICARDA and the application and integration of biotechnologies in the conservation and utilization of plant genetic resources for food and agriculture see paragraphs 118-120.

INTERNATIONAL CENTER FOR TROPICAL AGRICULTURE (CIAT) (see paragraph 131)

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

Molecular characterization of germplasm accessions

164. Molecular characterization of composite sets of germplasm, that include core or mini core collections, has helped in understanding genetic diversity and population structures in all five ICRISAT mandate crops and finger and foxtail millets. A total of 11,500 germplasm accessions of seven crops were genotyped with 19-50 SSR markers and genotyped based reference sets developed (Table 1) for use by global community.

Table 1. Molecular characterization and of germplasm collections at ICRISAT.

Crop	SSRs		Composite collection			Reference set	
	Genotyped	Used in analysis	Accessions genotyped	Accessions used in analysis	Alleles	Accessions	Alleles
Sorghum	46	41	3384	3,367	789	384	615
Pearl millet	20	19	1021	1,021	230	300	218

Chickpea	50	48	3000	2,915	1,683	300	1,315
Pigeonpea	20	20	1000	952	197	300	164
Groundnut	21	21	1000	852	490	300	466
Finger millet	20	20	1000	959	231	300	206
Foxtail millet	19	19	500	452	362	200	315

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (IDRC)

165. IDRC-supported research is expanding the application of DNA barcoding to developing countries. The DNA barcode is a very short standardized DNA sequence in a well-known gene, providing a secure and manageable way of identifying the species to which an animal, plant or fungus belongs. The barcoding tool was developed at the University of Guelph, which houses the International Barcode of Life (IBOL) project. Barcoding can potentially be applied to resources conservation, disease prevention, invasive species detection, water quality control, disease vector monitoring, illegally traded plants or animal identification, and the elimination of weed seeds among seed collections. This project is establishing barcode libraries in Argentina, South Africa, Costa Rica, Kenya, and Peru. The project will also develop guidelines for dealing with ABS issues, to build scientific capacity in developing countries, and to foster dialogue between researchers and funding organizations concerning barcoding science.

INTERNATIONAL INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT (IIED)

166. Our work on ways of applying and integrating biotechnologies in the conservation and use of genetic resources focuses on the methodological and institutional innovations needed to include farmers and citizens in framing priorities for scientific research and assessments of impacts and risks of new biotechnologies. IIED's work in this area thus fills an important gap in current decision-making and global governance on the use of biotechnologies for conservation and use of genetic resources. Our work with partners on deliberative and inclusive processes offer new models for involving hitherto excluded actors (small farmers, pastoralists, forest dwellers, users of aquatic genetic resources...) in i) the upstream definition of strategic priorities and policies for agricultural research, and ii) in the production and validation of knowledge on biotechnologies for conservation and use of genetic resources (see: www.excludedvoices.org).

INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)

167. Application of biotechnologies to conservation and utilization of genetic resources:
- Application of micro-satellite markers to assess genetic diversity threats indigenous livestock breeds in 16 Asian and 7 Eastern African countries.
 - Understanding the genomics of disease resistance of indigenous African sheep (gastro-intestinal nematodes) and cattle (trypanotolerance) using genetic markers.
 - Adapting and pilot-testing of emerging reproductive technologies as bio-banking and multiplication options for threatened populations of indigenous cattle
 - Application of a combination of nuclear transfer technologies for introgressing desirable disease resistance genes into susceptible and productive cattle breeds.
 - Applying Single Nucleotide Polymorphisms (SNPs) to determine breed compositions of admix and crossbred cattle populations for objective assessments of their comparative performances under farm conditions in East Africa.
 - Application and capacity development for biotechnologies to support plant health diagnosis and diversity studies of forages.

INTERNATIONAL MAIZE AND WHEAT IMPROVEMENT CENTER (CIMMYT)

168. The Sustainable Modernization of Traditional Agriculture (MasAgro) project supports Mexican farmers working in partnership with several organizations to improve agriculture in Mexico. The Mexican Government and the international scientific community are collaborating to increase maize and wheat productivity, to obtain higher returns on the yields of these two basic and strategic crops, and to make sure that increased productivity does not contribute to climate change.

169. MasAgro brings together national and international organizations in partnership with innovative Mexican farmers to obtain higher and more stable crop yields. Following an initiative of Mexico's Ministry of Agriculture, Livestock, Rural Development, Fisheries, and Food (SAGARPA) and of the International Maize and Wheat Improvement Center (CIMMYT), the project targets small-scale farmers who lack access to modern agricultural technologies and functional markets. MasAgro aims to help them increase their income through a combination of improved cropping practices (including conservation and precision agriculture) and conventionally-bred, high-yielding maize and wheat varieties to ensure that increased productivity does not have negative impacts that may contribute to climate change.

170. Seeds of Discovery SeeD, one of four projects within MasAgro, will use cutting edge DNA sequencing techniques to study and to classify the maize and wheat genetic diversity stored in the collections held by CIMMYT, ICARDA, IITA germplasm banks. SeeD is indeed an ambitious project, and is one of the first of its kind in the world. The resulting classifications will be made available to breeders and researchers worldwide through a secure online system, similar in operation to a library catalog or to a web search engine. SeeD's ultimate objective is to identify genes that may help to raise maize and wheat yield potential. Mexican institutions will be actively involved in the project, to enable their scientists to use native genes in their genetic improvement programs.

171. New MAIZE and WHEAT CGIAR Programs to fight hunger, poverty, and resource degradation. In collaboration with other CGIAR centers involved in maize and wheat research, most prominently IITA and ICARDA, CIMMYT has developed new strategies – called the MAIZE and WHEAT CGIAR Programs – that describe how the world's maize and wheat research and development communities must work together for food security, providing maize and wheat at prices affordable to the poor and doing so in the face of rising demands and climate change, while protecting the environment. Research in each respective Consortium Research Program is organized in ten distinct Strategic Initiatives. Conserving genetic resources for present and future needs to sustain agricultural development, is one of these, and uses the leveraging of top-end genomic and phenotypic technologies to uncover the genetic heritage of maize and wheat and to build a researcher/breeder oriented platform that assists wheat researchers and breeders globally in targeted mobilization of novel diversity into breeding programs via well-characterized accessions and parental germplasm.

INTERNATIONAL RICE RESEARCH INSTITUTE (IRRI)

172. New informatics technologies and biotechnologies and the associated strengthening of national systems and the private sector, present major new opportunities and challenges. Through GRiSP we have developed an innovative strategy exploiting these new opportunities for more effective use of the *ex situ* collections, through upgrading germplasm characterization, elucidating gene function, discovering novel alleles and more effectively deploying genetic diversity in new varieties and farming systems.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD)

173. The main output of OECD's work on *Harmonisation in Biotechnology and Safety of Novel Foods and Feeds* is its consensus documents. They contain information used by regulators to assess the safety of new varieties of genetically modified crops. Amongst other things, they provide information on the biology of crop plants which are major trading commodities such as maize, soybean, rapeseed and rice. For example, they describe the **centres of origin and diversity** of such crops. They also compile scientific information on the nutritional composition of crop plants, such as key nutrients, toxicants, anti-nutrients and allergens.

174. To date, 61 Consensus/Guidance Documents have been published. They are available through the OECD website (www.oecd.org/biotrack/). OECD also has a database which includes information on genetically modified crops in commercial use (<http://www2.oecd.org/biotech/>). Currently, this is being updated in co-operation with the FAO and the Secretariat of the Convention on Biological Diversity.

175. Finally, the OECD is currently scoping the potential role of biotechnology in facilitating the adaptation of crops to the impacts of climate change.

SECRETARIAT OF THE PACIFIC COMMUNITY (SPC)

176. Generally limited resources hinder the adoption and integration of biotechnologies in the conservation and utilization of genetic resources for food and agriculture, however the SPC Centre for Pacific Crops and Trees (CePaCT), carries out research on the cryopreservation of edible aroids supported with funding from the Trust. The CePaCT also uses modern, up-to-date molecular technologies for virus testing of taro, yams and bananas to facilitate distribution of the CePaCT's collections to the SPC 22 member countries for evaluation and utilization.

177. Under the FAO Animal Genetic Resources Pilot Project just completed, the project utilised DNA extraction and analysis through the services of the ILRI, Beijing, China for Inventory and Characterisation indigenous pigs and chickens in 6 Pacific Countries. This project detected a unique chicken type found only in one of the six countries. There is an urgent need to extend this work to other countries in the Pacific.

SOUTH EAST REGIONAL INITIATIVES FOR COMMUNITY EMPOWERMENT (SEARICE)

Facilitate the Undertaking, Compilation and Analysis of Studies on the Impacts of IPRs and Biotechnologies

178. SEARICE has been advancing the debate on use of biotechnologies, bringing in community perspectives that call for caution; undertake more studies on the impacts of biotechnology on health, environment, food, economies and the community in general. SEARICE has challenged the commercialization and release of these technologies in relation to potential negative impacts on agricultural biodiversity conservation and advancement of Farmers' Rights.

We call on the Commission to facilitate the undertaking, compilation and analysis of studies on the impacts of IPRs and above-mentioned technologies on plant genetic resources and on Farmers' Rights.

THIRD WORLD NETWORK (TWN)

179. TWN aims to ensure biosafety through comprehensive and holistic technology assessment of modern biotechnologies based on the Precautionary Principle. This is done mainly through enhancing the capacity of NGOs, scientists, regulators and policy makers to further their understanding and analysis on the risks associated with genetically modified organisms. Since 2003, TWN has co-organised with GenØk–Centre for Biosafety (the national centre for biosafety in Norway) and INBI–Centre for Integrated Research in Biosafety (New Zealand), an annual international biosafety capacity-building training course. TWN has also co-organised with GenØk and regional universities/research centres regional biosafety capacity-building courses (in Indonesia, Peru, South Africa, Brazil and India).

180. The TWN biosafety programme also aims to increase worldwide public awareness on genetic engineering and biosafety through research and analysis, documentation and publications. A dedicated website (www.biosafety-info.net) and electronic information listserve reaches out to more than 3,000 recipients. TWN also conducts policy/advocacy/campaigning activities, particularly at international meetings in relation to the Cartagena Protocol on Biosafety; organises and participates in conferences and seminars; and networks extensively.

WORLD AGROFORESTRY CENTRE

181. World Agroforestry Centre integrates biotechnologies in domestication research and development for priority agroforestry tree species; for example, tissue culture research is being undertaken for important species such as *Allanblackia stuhlmannii* which has limited regenerative potential and of particular importance in upscaling within a public private partnership with Unilever. Molecular approaches are used to assess genetic diversity and genetic structures of high value agroforestry species e.g. *Warburgia ugandensis*, *Dacryodes edulis*, *Tamarindus indica*, *Mangifera indica*, etc. The findings are used to develop management (utilization and conservation) strategies ensuring optimum gene flow for high productivity, promoting a wide genetic base of productive tree species when planted within farming landscapes, advising on minimum viable populations, etc. Molecular markers are also used to study genetic diversity in fragmented landscapes and along climate gradients to understand impacts both within natural and planted populations. Utilization of wide genetic base of productive trees in farming landscapes also contributes to conserving tree genetic diversity while providing a decentralized access to quality germplasm for local communities.

182. Training material is developed and capacity of national partners is enhanced in use of biotechnologies for genetic resources management.

WORLD INTELLECTUAL PROPERTY ORGANIZATION (WIPO) (see paragraph 73)

2.4 Climate change and genetic resources for food and agriculture

ACTION GROUP ON EROSION, TECHNOLOGY AND CONCENTRATION (ETC GROUP)

183. In 2008, ETC Group released its first report on the efforts of big agricultural transnational companies to monopolize genetically engineered, “climate ready” traits intended to withstand environmental (i.e., abiotic) stresses associated with climate change, such as drought, heat, cold, floods, saline soils, etc. A second report on patenting trends on “climate ready” traits was published by the ETC Group in October 2010. Between June 2008 and June 2010, the Gene Giants and their biotech partners submitted at least 261 “inventions” related to climate-ready crops to patent offices around the world seeking monopoly protection. Just six corporations (DuPont, BASF, Monsanto, Syngenta, Bayer and Dow) and their biotech partners control 77% of the 261 patent families (both issued patents and applications).

184. Many of these patent claims are for so-called “climate-ready” gene sequences that are found in many or all agricultural species including all or most of the material covered under Annex I of the Treaty and some of these extend to the end-uses of plant material as food or feed. The ETC Group strongly proposes to the CGRFA-13 to review these patents and taking into account of their implications for national food security and food sovereignty, to consider either suspending or rejecting such patents or applications. It is further requested to the Commission to bring this issue to the attention of the legal office of FAO to consider whether or not these patents violate the ITPGRFA.

BIOVERSITY INTERNATIONAL

185. The climate change work of the CGIAR Centres will now be addressed through the CGIAR Research Programme (CRP) on “Climate Change, Agriculture and Food Security (CCAFS)”.³¹ CCAFS will address the increasing challenge of global warming and declining food security on agricultural practices, policies and measures through a strategic collaboration between the CGIAR and the Earth System Science Partnership (ESSP).³² Led by CIAT, CCAFS is collaborating with all 15 CGIAR research Centres as well as with the other thematic research programmes of the CGIAR. The use of genetic diversity for adaptation to climate change and associated risk management will be investigated and assessed within two of the Themes of the CCAFS programme.

³¹ <http://www.ccafs.cgiar.org>

³² <http://www.essp.org>

186. Within the framework of this CRP, Bioversity International is leading a number of projects in East Africa, India and South East Asia, on using local diversity conserved in genebanks to help farmers, especially women farmers, cope with climate change. Bioversity has also recently launched a new international 3-years project supported by IFAD and CCAFS (CRP-7) which will be dealing with on farm conservation, neglected and underutilized species and climate change. This effort, which will be implemented in India, Nepal and Bolivia will, *inter alia*, survey best practices in using traditional crops to cope with climate change, test out novel approaches to participatory monitoring of agrobiodiversity and ways to strengthen the role of custodian farmers.

187. CCAFS will be organizing a side-event during the Thirteenth Regular Session of the Commission on GRFA, entitled “Genetic resources activities in the new Climate Change, Agriculture and Food Security (CCAFS) programme of the CGIAR” during which Bioversity International, CIAT and ICARDA staff members and representatives of partnering organizations will be presenting their work.

188. Representatives from Bioversity, as well as from CIAT and IITA, will participate in the Special Information Seminar “Climate change and genetic resources for food and agriculture: state of knowledge, risks and opportunities”, scheduled for 16 July 2011 at FAO, previous to the Thirteenth Regular CGRFA session.

189. Bioversity staffs are contributing to the development of background study papers on the impacts of climate change on microbial genetic resources and forest genetic resources for the Thirteenth Regular Session of the Commission on GRFA.

CENTRO AGRONÓMICO TROPICAL DE INVESTIGACIÓN Y ENSEÑANZA (CATIE)

190. Debido a la alta vulnerabilidad de la región centroamericana a los efectos del cambio climático es necesaria la evaluación de germoplasma resistente a condiciones adversas. Actualmente CATIE está evaluando materiales de cacao en distintas condiciones climáticas para evaluar su comportamiento.

191. Además está prevista la evaluación por parte de agricultores de los principales cultivos alimenticios en Centroamérica. Es necesaria la colaboración internacional para llevar a cabo proyectos para evaluar el comportamiento de los materiales silvestres conservados en CATIE con gran potencial para los desafíos de la agricultura como el cambio climático.

FRIDTJOF NANSEN INSTITUTE (FNI)

Selected ongoing project

192. The project ‘Sichuan Province Plan on Climate Change Adaptation and Biodiversity Management’ is concerned with the planning for a Climate-Biodiversity Province Plan for Sichuan province, China, developed as a model for combining climate change issues and improved management of biodiversity to mitigate and adapt to climate change-induced challenges.

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (IDRC)

193. IDRC supports research and capacity building to assess and deal with the impacts of climate change in Africa. African researchers are working with communities and policy makers to examine the vulnerabilities of agricultural systems and livelihoods. They are also working to test and develop context-specific adaptations, with a number of projects focusing on assisting small-scale farmers to adapt to an increasingly unpredictable climate through the testing of crop varieties, soil fertility management approaches, water conservation techniques, etc. In Malawi, for example, research is examining how farmer participation can inform adaptation strategies and policy responses to emerging climate change, HIV/AIDS, and rising food vulnerabilities. Strategies include alternative crops and agro-ecological methods, seed banks, food preservation options, and community-oriented activities.

INTERNATIONAL FEDERATION OF ORGANIC AGRICULTURE MOVEMENTS (IFOAM)

Standards and positions

194. IFOAM's basic standard prevents the clearance of primary ecosystems and prohibits the invasive threat of genetic engineering technologies.

INTERNATIONAL INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT (IIED)

195. IIED's work on the resilience of food systems and landscapes strongly focuses on the how remediation, mitigation and adaptation to climate change can be enhanced by harnessing biodiversity important for food and agriculture. Our work on pastoralism in dryland Africa is noteworthy in this regard (<http://www.iied.org/theme/1/Drylands>). Similarly, long term action research on sustaining local food systems, biodiversity and livelihoods emphasizes the fundamental roles of local organizations in using agricultural biodiversity to deal with uncertain change, including climate change (<http://pubs.iied.org/G02374.html>).

196. IIED and its partners have also identified how—and under what conditions—government and donors might support the development of innovative participatory approaches for the management of agricultural biodiversity to ensure food sovereignty and the right to food (see: <http://pubs.iied.org/G02780.html?k=jones> and <http://pubs.iied.org/14611IIED.html>). Recommendations are offered to tackle three interrelated challenges in particular:

- i) transforming knowledge and ways of knowing for the local adaptive management of agricultural biodiversity and resilience in the face of climate change and uncertainty;
- ii) scaling up and institutionalising participatory research and innovation in plant breeding, agroecological research, and the design of food systems;
- iii) policy reversals for the participatory management of agricultural biodiversity and the design of biodiversity-rich food systems that are equitable and resilient.

INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)

197. Climate change and genetic resources:

- Use geo-referencing tools to predict breeds/crosses performance under different climate-change scenarios.
- Assess and integrate indigenous knowledge into genetic management of livestock populations in Eastern African pastoral areas for improved adaption and production.
- Characterization of Napier grass for key traits to support conservation and utilization of diversity under changing agro-ecological contexts.

INTERNATIONAL RICE RESEARCH INSTITUTE (IRRI)

198. A significant portion of IRRI's portfolio addresses climate change. Since 2006 the work has been coordinated through the Rice and Climate Change Consortium (RCCC). As a cross-cutting issue, a Climate Change Strategy has been developed linking a number of GRiSP themes and linking to the related CGIAR Research Programme "Climate Change, Agriculture and Food Security" led by CIAT.

PRACTICAL ACTION (see paragraph 227)

SECRETARIAT OF THE PACIFIC COMMUNITY (SPC)

199. Recent high-level meetings have called for strengthened national capacity in aquatic biosecurity to meet the likely changes in disease or genetic risks, or to responsibly manage introduction of aquaculture species appropriate for changed climates.

200. The SPC CePaCT has established a "climate-ready" collection which comprises of crops and varieties with climate tolerant traits, for example salt and drought tolerant sweet potato. This

collection is undergoing evaluation by the Pacific countries. This activity necessitates collecting from the Pacific and also importing from IARCs such as CIP. The collection consists of edible aroids, sweet potatoes, yams and bananas. In addition a participatory breeding programme is active in Samoa screening for drought tolerant taro lines. Research is also ongoing in developing in vitro screening methods for drought tolerance in taro and salinity tolerance in swamp taro. SPC is one of the implementing agencies in the recently established International Network for Edible Aroids (INEA), as are three Pacific countries. This network with 18 country members will be providing support to farmers to help their efforts to improve adaptation of taro to changing climate especially drought tolerance.

201. The development and conservation of locally adapted breeds of livestock has been identified as priority areas for adaptation to climate change by the Pacific region. Proposed activities will build on the activities of the FAO Animal Genetic Resources Project. At the forthcoming PHOVAPS meeting (July 2011) participants will be requested to present the livestock components of their NAPA's to the meeting. Based on the national livestock strategies developed at the PHOVAPS meeting, draft regional priorities, policies and projects will be formulated to support the implementation of national and regional strategies and programmes.

SOUTH EAST REGIONAL INITIATIVES FOR COMMUNITY EMPOWERMENT (SEARICE)

Recognize and promote farmers' participatory plant breeding efforts as a viable adaptation strategy in climate change

202. Climate change adaptation work should include community plant breeding systems that must be set up to secure local seed systems, under the direct control, management and observation of farmers in their different management systems and micro-niches. This, along with PGRFA conservation and sustainable use needs to be supported at the international and national level.

203. There is likewise a need to bring community perspectives and farmers' voices in the debate and discussion on climate change and PGRFA.

THIRD WORLD NETWORK (TWN)

204. On the issue of climate change and its relationship with food and agriculture, TWN's sustainable agriculture programme has highlighted the benefits of ecological agriculture approaches, not only for climate adaptation and mitigation, but also in providing benefits for rural livelihoods. The conservation and sustainable use of agricultural biodiversity is critical in this respect, particularly in providing the genetic resources base that would ensure resilience.

205. TWN was a co-sponsor of the International Conference on Organic Agriculture and Food Security, which was held in FAO in 2007 and considered organic agriculture as key to addressing climate change and food security challenges. At the 2008 Conference on Ecological Agriculture: Mitigating Climate Change, Providing Food Security and Self-Reliance for Rural Livelihoods in Africa, held in Addis Ababa, Ethiopia, co-organized by the African Union, FAO, Ministry of Agriculture and Rural Development of Ethiopia, in collaboration with TWN and the Institute for Sustainable Development, Ethiopia, the benefits of biodiversity-based ecological agriculture in the face of climate change featured prominently. A result of that Conference, chapters of which are currently available online at the FAO website, is the book *Climate Change and Food Systems Resilience in Sub-Saharan Africa* (2010).

206. TWN has also participated in the International Assessment on Agricultural Science, Technology and Knowledge for Development (IAASTD), and contributed to the UN ESCAP report *Sustainable Agriculture and Food Security in Asia and the Pacific* (2009) and the Agriculture chapter of UNEP's publication, *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication* (2011), all of which point to the need to refocus agricultural policy and practice away from monocultural industrial agriculture, which threatens agricultural biodiversity, and towards

ecological agriculture (including as practiced by smallholder farmers), particularly in light of the challenges of climate change.

WORLD AGROFORESTRY CENTER

207. Through the VECEA project (Vegetation and Climate change in East Africa), a collaboration between World Agroforestry Centre and FLD, high resolution vegetation maps have been developed for eastern Africa (Ethiopia, Kenya, Malawi, Rwanda, Tanzania, Uganda and Zambia). Draft versions of the maps are currently being evaluated at:

<http://en.sl.life.ku.dk/Forskning/DevelopmentEnvironment/Publications/map.aspx>. Each of the vegetation types is linked by a tree species composition table for tree and shrubs species that are known to occur naturally in a particular vegetation type. It is therefore possible to make recommendations for suitable tree species to be planted by using the distribution of a vegetation type as a proxy for the habitat suitability map of one of the species that occur in the species assemblages of that vegetation type. Moreover, by the end of the project in September 2011, projections will have been made for shifts in the occurrences of vegetation types for at least 6 climate change scenarios; these will allow to project possible changes in the suitability domains of agroforestry species.

WORLD INTELLECTUAL PROPERTY ORGANIZATION (WIPO)

Innovation, Investment and Knowledge Transfer for Food Security – How Intellectual Property Protection Can Contribute

208. WIPO as the leading institution for IP protection has a major responsibility to raise awareness on how IP can stimulate innovation, investment and knowledge transfer for food security and to assist in creating a suitable legal and administrative framework in developing countries with that objective.

209. A series of activities is planned with a view to demonstrate, in a coordinated action with selected partners from the plant related innovation industry, the public agricultural research sector, farmers associations of selected developing countries and relevant intergovernmental (FAO, UPOV) and non governmental organizations, IP driven success stories of large scale agricultural development with a particular focus on food security. Stimulating plant breeding will be of particular relevance.

2.5 Progress report/periodic assessment/review of the Multi-Year Programme of Work

BIOVERSITY INTERNATIONAL

Forest genetic resources, including Report of the First Session of the Intergovernmental Technical Working Group on Forest Genetic Resources

210. Bioversity, the World Agroforestry Centre (ICRAF), and the Center for International Forestry Research (CIFOR) are involved in a new CGIAR Research Programme (CRP) on forests, trees and agroforestry, which has a significant component on genetic resources. Bioversity works on conservation and use of the genetic resources of forest tree species, with a focus on those harvested from the wild. Bioversity's future research will concentrate on understanding patterns of genetic diversity and developing strategies and guidelines for its conservation in priority tree species in Africa, Latin America and Southeast and Central Asia. Species are chosen as priorities because of their value to local people, in consultation with partners, usually through forest genetic resources networks which provide an important mechanism for collaboration (see below).

211. Bioversity is contributing to the preparation of the report on *The State of the World's Forest Genetic Resources* (SOW-FGR) by assisting in the development of guidelines and a template for collection of country-level data. Bioversity also hosted and/or participated in regional workshops involving Forest Genetic Resources Networks (APFORGEN in Asia, SAFORGEN in Africa and LAFORGEN in Latin America) where FAO representatives and Bioversity staff presented the plans and the process for developing the SOW-FGR. National participants at the workshops provided inputs on the guidelines and template for collecting information at the country level. Such events took place in February 2010 in Quito, Ecuador; in March 2010 in Brazzaville, Congo; in December 2010 in Cali,

Colombia; in March 2011 in Kuala Lumpur, Malaysia; in April 2011 in Nairobi, Kenya and in June 2011 in Tunis, Tunisia.

212. Bioersivity is also contributing to the development of four thematic studies for the SOW-FGR, by developing, with colleagues from several institutions including ICRAF, chapters on indicators of forest genetic diversity, use and transfer of FGR, the role of FGR in adaptation to biotic and abiotic factors with a focus on climate change, and use of native species in ecosystem restoration and reforestation. Bioersivity also co-organized with FAO, a workshop in May 2011 and plans to co-organize another workshop in fall 2011 to advance the development of all of the thematic studies.

213. The Forest Genetic Resources Training Guide, a modular series of training materials developed by Bioersivity, which is intended to strengthen capacity for management of forest genetic resources, was launched in May 2011.

CAB INTERNATIONAL (CABI)

214. CABI has relevant traditional strengths and activities in the management of information, and the study and use of invertebrate and micro-organisms (particularly fungi and bacteria) for food and agriculture.

215. To the extent that CGRFA's work programme includes invertebrates and micro-organisms, CABI has common interests and has already worked with CGRFA on two study reports dealing with invertebrates:

- 2009. The use and exchange of biological control agents for food and agriculture. Background Study Paper No. 47.
- 2011. Climate change and invertebrate genetic resources for food and agriculture: state of knowledge, risks and opportunities Background Study Paper No. 54.

216. CABI considers that the use of genetic resources of and derived from micro-organisms has considerable potential in the food and agriculture sectors, as well as many others. CABI is ready to cooperate with CGRFA as it develops its work programme in this area. However, it needs to be recognised that they are a special case as they are ubiquitous, multifunctional and are not accessed in the same way as plant genetic resources. Biotechnology extends beyond simple derivatives, but biopesticides, nitrogen-fixing genes, and the like are relevant. Once you start looking at biotechnology and commercial use then it is difficult to know where to draw the line between agricultural applications and those of other sectors. CABI has much to contribute to the exploitation of micro-organisms within a mutually beneficial operational framework.

CENTRO AGRONÓMICO TROPICAL DE INVESTIGACIÓN Y ENSEÑANZA (CATIE)

217. En CATIE conscientes del valor del uso sostenible de los recursos genéticos para la alimentación y la agricultura tanto para generación actual como para la futura continuará realizando informes y evaluaciones sobre el estado de sus recursos genéticos y fomentará la aplicación del Plan Estratégico de la FAO.

CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

218. SBSTTA-14 considered reports provided to it by the CBD Secretariat, the FAO and its Secretariat of the CGRFA which included progress with various elements of their Joint Work Plan (2009-2011). Subsequently, CBD COP-10, in decision X/34, para. 2, noted with appreciation the ongoing work of the FAO and the CGRFA, welcomed the Strategic Plan for the period 2010-2017 for the implementation of the MYPOW and the planned periodic publication of *The State of the World's Biodiversity for Food and Agriculture*, and on their different genetic resources components, and in particular the publication of *The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture*, which will provide a solid technical base for the further development of the *Global Plan of Action* on plant genetic resources, as well as the adoption of the Funding Strategy for the implementation of the *Global Plan of Action on Animal Genetic Resources*, and invited Parties,

and other Governments, to take into account the inter disciplinary and inter-sectoral nature of these publications in their implementation of the programme of work on agricultural biodiversity.

219. The CBD Secretariat and FAO Secretariat of the CGRFA have prepared a revised Joint Work Plan in response to relevant decisions of CBD COP-10.

INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS (ICARDA)

Collaboration with FAO

220. ICARDA provided comments and suggestions on the draft strategic plan 2010-2017 for the implementation of the Multi-year Programme of Work of the Commission on Genetic Resources for Food and Agriculture.

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

221. ICRISAT genebank conserves 119,691 accessions of its five mandate crops and six small millets representing 144 countries. However, only a small proportion (<1%) of them has been used in crop improvement. ICRISAT has provided 114 sets of core and mini core collections on request to scientists in 22 countries and more than several promising sources of germplasm were identified at ICRISAT and by NARS using these sets. Using core and mini core approach, ICRISAT and partners have identified trait-specific germplasm in groundnut, chickpea, and pigeonpea. Sources for high oil and protein contents, large seed size, yield potential, early maturity and drought related traits in groundnut; for high yield, early maturity, large seed size, drought resistance traits, salinity tolerance and diseases resistance in chickpea; and for early maturity, high yield, and resistance to sterility mosaic disease and salinity tolerance have been found in mini core collection in pigeonpea.

222. We believe that CGRFA/FAO and ICRISAT can collaborate effectively in enhancing use of germplasm in crop improvement programs in support of the implementation of the Commission's MYPOW in the following areas.

1. Evaluation of the mini core collections of the crops available with ICRISAT for traits of economic importance (crops: chickpea, sorghum, pearl millet, groundnut, pigeonpea, and finger millet) for
 - Biotic stresses (diseases, insect pests)
 - Abiotic stresses (drought, salinity)
 - Grain quality
 - Agronomic traits
2. Assisting scientists to establish mini core collections for other crops for which such sets are not available, so that the global scientific community accelerates the use of germplasm in their R & D programs.

223. ICRISAT has the basic infrastructure and competent scientific personnel and commitment to develop and deliver International Public Goods such as mini core and trait-specific germplasm.

INTERNATIONAL RICE RESEARCH INSTITUTE (IRRI)

224. Subject to availability of resources, IRRI welcomes working with the Commission wherever there are opportunities for synergy. Issues for consideration could include holistic analyses of policy relevant to the development of new partnerships such as the Hybrid Rice Development Consortium, in light of the wide range of technical and policy developments, e.g. in informatics, biotechnologies, public-private partnerships, farmers' rights and IP rights on new inventions.

PRACTICAL ACTION

225. In our advocacy work we have focused on promoting biodiverse systems that will secure future food. These depend on increasing of agricultural biodiversity in ecological food provision. This

is an essential component in production systems that support the realisation of food sovereignty, which will defend the local food systems that currently provide food for most people in the world and could efficiently do so forever.

226. These systems face multiple threats, however, in terms of access to the resources needed for production including genetic resources for food and agriculture (GRFA) because of laws, intellectual property rights, commercial contracts, and technologies that restrict access and facilitate monopoly control over these essential genetic resources. In the MYPOW, it must be a key task of the CGRFA to identify and remove these restrictions that reduce biodiversity and limit access for small-scale, biodiversity-defending, food providers.

227. These smaller-scale production systems are more resilient to many biosocial threats such as climate change and can better utilise and conserve resources such as land and water in the production system. They use fewer external inputs and produce fewer emissions of greenhouse gases than industrial production systems. They produce, in general, higher quality food. We have summarized these issues, based on our practical work and research, in several publications including *Biodiverse Agriculture for a Changing Climate*. Defending this model of production should be a core element in the MYPOW.

228. We would support the proposal to include in the MYPOW the preparation of a *State of the World's Agricultural Biodiversity*, in all its dimensions. We would advocate that this should be based on the experience and perspective of those who sustain and develop the world's agricultural biodiversity – the small-scale food providers themselves. Using an inclusive process similar to that adopted by the Committee on world Food Security (CFS) would facilitate their inclusion in the preparation of the necessary inputs for the document and its follow up plan of action.

III. SUBMISSIONS RELEVANT TO OTHER AREAS OF THE COMMISSION'S MULTI-YEAR PROGRAMME OF WORK

3.1 Animal genetic resources

FRIDTJOF NANSEN INSTITUTE (FNI) (see paragraph 246)

INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS (ICARDA)

Technical backstopping and capacity development

229. For small ruminants genetic resources, two Ethiopian students were trained on community-based sheep breeding programs and completed their PhD in January 2011. A post-Doc on molecular characterization of the Ethiopian goat breeds was completed in July 2010. An in-country training for 23 national technicians in Libya in December 2009 was conducted on sheep and goat characterization surveys.

Collaboration with FAO

230. ICARDA participated in the preparation of the first *State of the World's Animal Genetic Resources for Food and Agriculture*.

231. For information on ICARDA's activities on the application and integration of biotechnologies for the conservation and use of animal genetic resources see paragraphs 160 to 163.

INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)

Contribution to the Global Plan of Action for Animal Genetic Resources

232. *A-Characterization, inventory and monitoring of trends & associated risks*

- Comparative analysis of performance of indigenous and exotic breeds in 5 Asian, 4 West African and 6 Eastern and 1 southern African countries.

- Development and testing of decision support tools for characterizing the production systems of indigenous livestock breeds / wild relatives in 5 Asian, 10 African countries for conservation and sustainable management (GEF-supported).

233. *B-Sustainable use and development*

- With farmer organizations, developed databases, performance recording, genetic evaluation and farmer feedback systems to support dairy cattle and sheep breeding programs in Kenya, Rwanda and Uganda and Ethiopia.
- Using participatory procedures and bi-economic and ecological models, assessed the Africa (The Gambia, Guinea, Senegal and Mali) through better utilization of their ERL assets. These include an assessment of the natural resource base.
- Applying high density single nucleotide polymorphism (SNPs) to determine breed composition of smallholder dairy cattle. Combine SNP data with participatory appraisals of animal and farm performance to determine the most suitable genotypes. In partnership with other organizations assess feasibility and develop business model for delivery of improved genetics to smallholders.

234. *C-Conservation*

- Developed with country teams, data-bases and ex-situ genebank guidelines and priorities for indigenous cattle, sheep and goats breeds in 6 Eastern Africa countries.
- Facilitated a process for harmonized regional conservation policies for selected trans-boundary indigenous livestock breeds of Eastern Africa.
- In collaboration with FAO and ASARECA facilitated capacity building session on ex-situ gene-banking protocols and facilities.

235. *D-Policies, institutions and capacity building*

- In collaboration with FAO, the Chinese Academy of Agricultural Sciences, ASARECA, the International Atomic Energy Agency (IAEA), the Brazilian Agricultural Research Corporation (EMBRAPA) and local universities trains scientists, MSc and Ph.D. students from East European, African and Asian countries in molecular characterization, applied reproductive, ex-situ conservation techniques and breeding program designs.
- In collaboration with the Swedish University of Agricultural Sciences (SLU) developed and updated the Animal Genetics Training Resource (AGTR) as reference tool for sustainable management of animal genetic resources.
- In collaboration with FAO and SLU involved in assessment of policies, institutional frameworks and general infrastructure related to livestock breeding in Southern and Eastern Africa.
- In collaboration with ICARDA and the University of Natural Resources and Life Sciences in Vienna, Austria (BOKU), developing good practice guidelines for community-based breeding programs of indigenous livestock in low input systems.

SECRETARIAT OF THE PACIFIC COMMUNITY (SPC) (see paragraphs 177 and 201)

3.2 Forest genetic resources

BIOVERSITY INTERNATIONAL (see paragraphs 208 to 211)

CAB INTERNATIONAL (CABI) (see paragraph 147)

FRIDTJOF NANSEN INSTITUTE (FNI) (see paragraph 245)

WORLD AGROFORESTRY CENTRE

236. In January 2011, World Agroforestry Centre adopted the revised Forest Genetic Resource Policy document which defines the roles and responsibilities of managing agroforestry tree species in accordance with relevant local and international legislation. It is committed to operate in conformity with international instruments that advocate the need for awareness and implementation of adequate measures for the sustainable utilization, conservation and benefit sharing of forest genetic resources.

3.3 Micro-organism and invertebrate genetic resources

BIOVERSITY INTERNATIONAL REPORTING ON THE SYSTEM-WIDE GENETIC RESOURCES PROGRAMME (SGRP) (see paragraphs 239 to 241)

CAB INTERNATIONAL (CABI) (see paragraphs 147 and 214 to 216)

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT) (see paragraph 15)

3.4 Access and benefit-sharing of genetic resources for and agriculture

BIOVERSITY INTERNATIONAL REPORTING ON THE SYSTEM-WIDE GENETIC RESOURCES PROGRAMME (SGRP)

237. SGRP coordinated the System-wide technical inputs from the CGIAR Centres to the various negotiating meetings leading up to the adoption of the Nagoya Protocol on Access and Benefit-Sharing at the Tenth Conference of the Parties to the Convention (COP10). In between successive negotiating sessions, SGRP disseminated information to the Centres about the negotiations, and received input from the Centres regarding how to address ongoing issues in the negotiations.

238. As well as participating in COP10 itself, in the lead-up to COP10, SGRP policy staff participated in the following meetings on behalf of the CGIAR Centres, and developed the text for oral interventions that were made:

- Eighth meeting of the Ad Hoc Open-ended Working Group on Access and Benefit-Sharing (WG ABS 8), Montreal, Canada, 9-15 November 2009.
- Ninth meeting of the Ad Hoc Open-ended Working Group on Access and Benefit-Sharing (WG ABS 9), Cali, Colombia, 22-28 March 2010.
- Resumed Ninth meeting of the Ad Hoc Open-ended Working Group on Access and Benefit-Sharing (Resumed WG ABS 9), Montreal, Canada, 10-16 July 2010.
- Meeting of the Interregional Negotiating Group on Access and Benefit-Sharing (ING), Montreal, Canada, 18-21 September 2010.
- Second meeting of the Interregional Negotiating Group on Access and Benefit-Sharing (ING 2), Nagoya, Japan, 13-16 October 2010.
- Second Resumed Ninth Session of the Ad Hoc Open-ended Working Group on Access and Benefit Sharing (2nd Resumed WG ABS 9), Nagoya, Japan, 16 October 2010.
- Tenth Conference of the Parties to the Convention on Biological Diversity (COP10), Nagoya, Japan, 18-29 October 2010, where the “Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization to the Convention on Biological Diversity” was adopted.

239. During the negotiating sessions, SGRP also organized three side events dedicated to the ongoing work of the Centres on access and benefit sharing for GRFA. These are detailed below. Representatives of national programmes, CGIAR Centres, and advanced research institutes (ARIs) were invited to provide technical information to the side events, highlighting the importance of the proper resolutions of pertinent issues.

- At WG ABS 9, Cali, Colombia, 24 March 2010: “Leaving room for future development of ABS norms under the international regime - the example of agricultural microbial genetic resources”.
- At the Resumed WG ABS 9, Montreal, Canada, 12 July 2010: “The importance of recognizing the International Treaty in the CBD’s Protocol on Access and Benefit-Sharing”.
- At the Resumed WG ABS 9, Montreal, Canada, 13 July 2010: “Leaving room in the Protocol for the development of specialized international ABS arrangements. Examining the case of agricultural microbial genetic resources”.

240. In 2010, SGRP led the development of two policy briefs specifically targeting negotiators of the Nagoya Protocol. These are entitled “The importance of recognizing the treaty in the CBD Protocol on Access and Benefit-Sharing” (SGRP, Rome, Italy. 8 pp) and “Leaving room in the CBD’s ABS Protocol for the future development of specialized access and benefit-sharing arrangements – the example of agricultural microbial genetic resources” (SGRP, Rome, Italy. 4 pp). These briefs form the 5th and 6th in a series that SGRP has developed over the years. Over 1,000 copies of each were distributed to delegates at the three negotiating sessions held during 2010. The briefs, along with the oral statements, submissions, and technical papers prepared for the meetings are available from the SGRP website.³³

241. Two interim-multistakeholder consultations on access and benefit-sharing, supported by the Commission Secretariat, and coordinated by the University Catholic of Louvain, were organized in 2010 and in 2011. Bioversity, IITA and IIRI staff members participated in those consultations.

FRIDTJOF NANSEN INSTITUTE (FNI)

Selected ongoing projects

242. The Access and Benefit Sharing Research Project focuses on the implementation of the Convention on Biological Diversity (CBD) in Africa and internationally, with emphasis on its provisions on ABS. It is a contribution to the multi-donor ABS Capacity Development Initiative for Africa aimed at building human and institutional capacity in African countries.

243. The project ‘Stimulating Sustainable Innovation in Aquaculture’ aims to explore the need for legislation to promote sustainable innovation in aquaculture. It identifies the specific problems and possible solutions for legal regulation of access to aquatic genetic resources and protection of the results of research and development concerning salmon, cod and tilapia genetic resources.

244. The project ‘Intellectual Property Rights to Genetic Resources: Prospects for a Sui Generis Path for Developing Countries’ is addressing law regulating exclusive individual rights to genetic resources. A core issue is the distributive effects from individualised rights, as patents and plant breeders' rights, between persons and among developing and developed countries.

Important past projects

245. The project ‘Evaluation of Need for Legislation on Access and Rights to Forest Genetic Resources in the Nordic Region’ was aimed at clarifying whether it is necessary and possible to take legal steps to ensure that forest genetic resources remain under a viable public domain and open exchange system.

246. ‘Legal Regulation of Aspects on Property Rights to Animal Genes, Genetic Resources, Breeding and Related Knowledge’ was an interdisciplinary project carried out with CGN, Wageningen, analyzing the effectiveness and fairness of current animal genetic resource exchange and the need for additional international architecture governing this exchange.

³³ <http://www.sgrp.cgiar.org/?q=node/172>

INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS (ICARDA)

Contribution to policy development

247. ICARDA participated to the SGRP discussions to propose CGIAR policies on access and exchange of genetic resources for consideration by the Genetic Resources Policy Committee. Policy proposals related to distribution of genetic resources for non-food and /non-feed uses, draft Germplasm Acquisition Agreement (GAA) and review of the Nagoya Protocol were discussed and the following practices were advised:

- For restoration/repatriation of genetic resources to farmers or to partners who provided the germplasm under MLS, SMTA can be used as an act of facilitated access (except for crisis aid no need to use SMTA);
- Related to requesters asking for large number of accessions, The genebank managers could determine the best way to respond to these requests by asking for more specifications or by applying methods to select best bet subsets;
- For requests asking for accessions for conservation, all accessions originating from the country can be repatriated;
- For Material requested for direct use by farmers and non-food and non feed utilization: this is a very sensitive issue, need to use an appropriate MTA;
- SMTA is not needed for transferring germplasm within the same legal entity (e.g, from genebank to breeders at the same institution);
- Need for a revision of SMTA for distribution of material under-development to allow for selecting lines from landraces, to allow NARS to release varieties from germplasm supplied by CG centers and to solve the problem of transferring for direct use material received with SMTA;
- Distribution of germplasm for direct use by farmers, no problem for in Trust Material but problem for material received under SMTA. In the later case either we distribute seeds with SMTA or consider that farmers will perform more selection on the supplied germplasm (Use for research);
- ICARDA works in partnership with NARS to select elite germplasm (Material under development) which can be released by NARS provided that no restriction is done on the use of such material in other developing countries for the same purpose. In case of supply of finished material, it is much better to use a License to allow NARS to directly use the fixed germplasm.

248. ICARDA is collaborating with the General Commission for Scientific and Agricultural Research in Syria (GCSAR) on a case study financed by the Central Advisory Service for Intellectual Property (CAS-IP) within the national partners' initiative (NPI) on "National and local IP arrangements for promoting benefit sharing and on-farm conservation and exchange of landraces of cereals in Sweida region". The draft report was produced based on the review of existing national and international legislations related to farmers' rights, farming systems and local knowledge surveys in Sweida region, and on meeting with representatives of farmers, decision makers, researchers, extension staff and other stakeholders.

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (IDRC)

249. Current IDRC initiatives related to plant genetic resources include research on policy development of fair access and benefit sharing (ABS) of genetic resources. Existing laws and mechanisms leave communities open to biopiracy because they protect individual, as opposed to collective, rights and do not recognize traditional knowledge or collaborative innovations. An IDRC project is bringing together experienced research teams (China, Jordan, Nepal and Peru) and international technical and legal experts to work on much needed policies, laws and practices for the fair use and management of genetic resources.

INTERNATIONAL INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT (IIED)

250. Our work on ‘Protecting community rights over traditional knowledge’ has helped broaden the ITPGRFA’s understanding of the concepts of Farmers Rights and Access and Benefit Sharing regimes. The current system of intellectual property protection designed to promote commercial and scientific innovation, offers little scope for protecting the knowledge rights of traditional farmers, indigenous peoples and healers who use PGRs. Safeguarding this rich knowledge base requires the development of alternative systems, which support the distinct socio-economic, cultural and ecological needs of local resource users. IIED and partners have focused on developing alternative tools to protect traditional knowledge which are rooted in local customary laws rather than based on existing Intellectual Property standards. Existing IPRs (e.g. patents, copyrights) are largely unsuitable for protecting rights over traditional knowledge because they provide commercial incentives, whereas traditional innovations are driven primarily by subsistence needs and are based on collective rather than exclusive rights. A broad approach to the protection of farmers rights is now needed, - one which goes beyond benefit-sharing to include protection of farmers' customary rights over genetic resources and associated landscapes, cultural values and customary laws, on which the continued conservation and improvement of crops by farmers depends (see: <http://pubs.iied.org/pdfs/G03077.pdf>).

INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)

251. Policies and arrangements for access and benefit-sharing:
- Information on exchange and use of forage germplasm and implementation of the SMTA for non-annex 1 crops of the Treaty.

PRACTICAL ACTION (see paragraph 226)

SOUTH EAST REGIONAL INITIATIVES FOR COMMUNITY EMPOWERMENT (SEARICE)

Free PGRFA from exploitation and misappropriation

252. There is a need to assist communities to explore options for protection of traditional knowledge and PGRFA from misappropriation and from loss by facilitating farmer-to-farmer exchanges, Participatory Plant Breeding (PPB) in collaboration with research institutions, exploring community registries and open innovations systems of community rights/Farmers’ Rights protection.

253. Mechanisms are needed to grant farmers priority access of breeding materials in MLS and ABS for PGRFA.

254. CGRFA can also facilitate the call for studies and submissions on ABS schemes for PGRFA.

THIRD WORLD NETWORK (TWN)

255. Third World Network (TWN) (www.twinside.org.sg) is an independent non-profit international network of organisations and individuals involved in issues relating to sustainable development, Third World and North-South affairs. TWN's International Secretariat is based in Penang, Malaysia. Its regional secretariats are based in Montevideo (Uruguay) and Accra (Ghana) and TWN has offices in Goa (India) and Geneva (Switzerland). TWN works with partner organisations in several developing countries and also cooperates with several organisations in the North.

256. TWN’s mission is to bring about a greater articulation of the needs and rights of peoples in the Third World, a fair distribution of world resources, and forms of development which are ecologically sustainable and fulfill human needs. Since its formation in 1984, TWN has been involved in research, publications and information dissemination activities, organised and participated in meetings, workshops and seminars on various international issues. Gender is a cross-cutting issue in TWN’s activities.

257. TWN has been actively following the negotiations under the Convention on Biological Diversity, particularly with regard to the fair and equitable sharing of the benefits arising out of the utilization of genetic resources and associated traditional knowledge, which has led to the recent

adoption of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention.

258. Related to this are the discussions on intellectual property rights under the WTO TRIPS Council and within WIPO, both of which are fora that TWN actively monitors. TWN also analyzes the impacts of bilateral and regional free trade agreements, highlighting the concerns of developing countries, including the impacts of intellectual property rights on farmers' rights and access to genetic resources. TWN is concerned about the misappropriation of genetic resources and associated traditional knowledge, including through intellectual property rights, as well as the lack of fair and equitable benefit-sharing with the holders of the resources and knowledge. These discussions have important bearing on the International Treaty on Plant Genetic Resources for Food and Agriculture, which shares the same objectives as the Convention.

UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

259. For the past few years, UNEP has been building capacity in access and benefit sharing and assisting countries and stakeholders in better understanding and implementing ABS provisions. Through a series of activities aimed to enhance the understanding of ABS issues and capacities of stakeholders to participate more effectively in the negotiation processes, UNEP played a significant role in better elaboration of key concepts for ABS ranging from access and compliance to implementation options for national ABS regimes. Through its knowledge publications and "how to" guides, UNEP provided support to several countries such as India in developing national benefit sharing frameworks. With support for a range of ABS experts, UNEP also established an ABS knowledge Hub to link experts with other stakeholders to better understand ABS issues.

260. UNEP has assisted 6 countries in Africa, 7 countries in Latin America and 11 countries in Southeast Asia regions in developing national ABS projects amounting to US\$ 9 million GEF funding and 15 million co-funding during the past one year. Additionally, UNEP is working closely with the Government of India in establishing local level benefit sharing funds.

WORLD AGROFORESTRY CENTRE

261. World Agroforestry Centre in cooperation with United Nations Environment Programme (UNEP), and Kenya Forest Service (KFS) hosted the First Pan-African Workshop on ABS and Forests in 2009 and contributes to most meeting on ABS at UNEP.

262. World Agroforestry Centre has signed an agreement with the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture placing the collections they hold under the Treaty. As from 1 February 2008, World Agroforestry Centre transfers all its plant genetic resources for food and agriculture, whether or not they are included in Annex 1 of the Treaty, using the SMTA.

263. World Agroforestry Centre has developed cost effective tree germplasm supply models with farmers eg Rural Resources Centre Approach (RRC) whereby RRCs act as attraction point for training and demonstration of new Agroforestry technologies, skills and knowledge with a focus on farmer-to-farmer knowledge dissemination approaches; In South East Asia, 'Nurseries of Excellence' have been established with partners to address nursery training and access to planting material for post-disaster and post-conflict conditions. Community Tree Seed Bank (CATS) Banks is an approach tested and promoted in Southern Africa- Malawi whereby farmers are organized into appropriate groups to commercialize tree seed as an income source. Each group receives starter seeds and then harvest their own seed. The group loans seed to new members, who pay seed back with seed interest. Existing tree stands can be used as collateral.

264. World Agroforestry Centre in collaboration with Forest and Landscape Denmark (FLD) and national partners have produced simple booklets for seedling and seed production, seed leaflets for priority tree species and undertaken training workshops on best practices. A training toolkit on tree seeds for farmers is available on-line at:

<http://www.worldagroforestry.org/sites/default/files/Tree%20Seeds%20for%20Farmers.pdf>.

WORLD INTELLECTUAL PROPERTY ORGANIZATION (WIPO) (see paragraphs 63 to 73)

3.5 International targets and indicators for biodiversity for food and agriculture

CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

Plant and Animal Genetic Resources

265. CBD COP-10 adopted the Strategic Plan for Biodiversity (2011-2020) including 20 Aichi Biodiversity Targets to inspire broad based action by all Parties and stakeholders. The conservation and sustainable use of genetic resources for food and agriculture is an important contribution to the plan and the periodic assessments of their state an important monitoring tool (particularly regarding target 13).

3.6 Biodiversity for food and agriculture and nutrition

INTERNATIONAL DEVELOPMENT AND RESEARCH CENTRE (IDRC)

Ecohealth and dietary diversity

266. A number of IDRC projects are also focusing on ecohealth and dietary diversity. In Kenya, for example, research looks at how biodiversity, by enhancing dietary diversity, can improve nutrition and health status in poor rural and urban communities. Interventions have ensured that farmers have access to seeds of indigenous food crops. Initiatives include: seed fairs to facilitate exchange of seeds between farmers, linking farmers with potential buyers, such as schools and supermarkets, and awareness raising and capacity building activities on the benefits of dietary diversity. In rural Lebanon, researchers are improving dietary diversity, food security and health in vulnerable communities. Over the years, communities have increasingly abandoned a varied diet in favour of cheaper and less diverse imported food. Rural ecosystems are also deteriorating, chiefly because of urban encroachment, water pollution and land abandonment. Mapping out the country's "food environment," including local food production and food imports, can help identify what is contributing to increases in ill-health. Other relevant information is given in paragraphs 133 to 136.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD) (see paragraph 173)

WORLD AGROFORESTRY CENTRE (see paragraph 29)

3.7 The State of the World's Biodiversity for Food and Agriculture

PRACTICAL ACTION (see paragraph 228)

3.8 Other matters

BIOVERSITY INTERNATIONAL

Other cross-sectorial matters

The Platform for Agrobiodiversity Research

267. The Platform for Agrobiodiversity Research (PAR) is a collaborative multi-stakeholder partnership, established in 2006, that brings together researchers and others to share knowledge and experiences that can improve the maintenance and use of agrobiodiversity. Currently hosted by Bioversity International, and working in close collaboration with FAO and other partners, the Platform's objectives are:

- To collate and synthesize agrobiodiversity data and information and disseminate knowledge, making available relevant tools and practices that support improved use of agrobiodiversity and identifying areas where research is needed.

- To identify ways in which the use of agrobiodiversity can contribute to addressing major global challenges, to make relevant information easily available and to provide options on the contribution of agrobiodiversity in these areas.
- To identify and facilitate relevant new and innovative research partnerships that strengthen cross-cutting, multidisciplinary and participatory research and to contribute to agrobiodiversity research capacity building in developing regions.

268. Over the last two years the Platform has provided a continuing information resource, analyzed the ways in which communities and indigenous peoples are using agrobiodiversity to cope with climate change, and collaborated with FAO to prepare a report on how biodiversity can contribute to food security, and improve sustainability.

Providing information

269. PAR's website now provides an up to date source of information and news on developments in agrobiodiversity research, funding opportunities and relevant meetings and events with direct links to other relevant websites such as Bioversity, Ecoagriculture Partners and Diversitas. Attracting some 10-15,000 visitors per month by the second half of 2009, the site was redesigned during 2010 to provide additional facilities including modules for groups who want web space for projects, group discussions or other web-based activities.

Agrobiodiversity and climate change

270. Over the past two years PAR has collected information on the ways in which indigenous peoples and rural communities are using agrobiodiversity to help cope with climate change. An interactive map has been created which provides direct links to over 200 different reports and case studies on use of agrobiodiversity and climate change and a synthesis paper published based on the information obtained. The synthesis paper draws three conclusions:

- 1) Adapting to climate change has usually involved a range of different actions at all three levels; ecosystem or landscape, farm or agricultural system, and involving both inter- and intra-specific diversity;
- 2) Innovation based on both traditional knowledge and new information has been important, and social (e.g. community) cultural and political dimensions have played a key role;
- 3) Use of traditional crop and livestock species and varieties, with new materials where necessary, has been a common feature.

Contributing to food security and sustainability

271. Together with FAO and with the support of Bioversity International, PAR organized an expert workshop in 2010 and, based on this, has prepared and published a report "Biodiversity for Food and Agriculture: Contributing to food security in a changing world". This report provides clear evidence of the contribution biodiversity can make to improving agricultural production and productivity, outlines some of the ways in which this can be achieved and identifies major challenges that need to be overcome to fully realize the potential contribution of biodiversity in agricultural production systems.

BIOVERSITY INTERNATIONAL REPORTING ON THE SYSTEM-WIDE GENETIC RESOURCES PROGRAMME (SGRP)

System-wide Genetic Resources Programme

272. From 1995 until 2010, SGRP served as a key mechanism for cross-sectorial genetic resources work in the CGIAR Centres. It has facilitated collaboration among the Centres and with national and international organizations, to enhance the CGIAR's contribution to global efforts to conserve genetic resources for use in agriculture, forestry and fisheries. This has included fulfilling representation and public awareness functions, and contributing to international agendas on the Centres' behalf. Bioversity International was the convening Centre of SGRP; representatives of the Centres, FAO and the International Treaty comprised its steering committee, the Inter-Centre Working Group on Genetic

Resources (ICWG-GR). Over this time scale, SGRP served as the mechanism for information exchange and collaboration between the FAO Commission and CGIAR Centres. As all CGIAR system-wide programmes, the SGRP came to an end on December 31, 2010³⁴.

REHABILITATION OF GLOBAL PUBLIC GOODS PROJECT, PHASE 2 (GPG2) SUMMARY OF CENTRE-OWN AND COLLECTIVE ACTIVITIES

Centre-own activities

273. The broad aim of Centre-own activities within GPG2 was to ensure that CGIAR genebank collections maintained the international standards of stewardship expected by stakeholders. These activities, tailored to individual Centre needs, achieved the removal of backlogs in the processing of accessions into storage, and the safety backup of the in-trust collections. In the process, GPG2 provided a significant research and learning opportunity in the handling of diverse germplasm. The processing of materials from vegetatively propagated crops, such as cassava, banana, potato, sweetpotato, and yam, presented technical challenges, particularly for *in vitro* conservation and safety-duplication for the Centres managing those crops (i.e. Bioversity, CIAT, CIP and IITA). Likewise, at Centres such as ICARDA, ICRISAT and ILRI, the management of certain crops was particularly challenging with regard to the regeneration of out-crossing species and the germination and viability testing of crop wild relatives.

274. A wide range of upgrades and improvements were made to Centre genebank infrastructure, resulting in greater overall physical security of the germplasm collections. Examples include improvements made to seed storage facilities in four Centres and to cryopreservation or *in vitro* facilities in three. Security for storage facilities was improved in two Centres and information management was improved in eight. As well as facilitating the processing of more material, the upgrades allowed the introduction of new technologies such as molecular identification of duplicates and improved *in vitro* conservation methods for clonal crops. All upgrades planned at the outset of the project were completed. Table 1 extracted from the GPG2 final report provides a summary.

Table 1: Summary of Centre-own facility upgrading activities

Activity area	Centres involved
Improved seed storage infrastructure	CIAT, CIMMYT, ICRISAT, IRRI
Improved cryopreservation infrastructure	CIP, IITA
Improved <i>in vitro</i> storage infrastructure	CIAT
Improved security for storage facilities	CIAT, ICRISAT
Improved field infrastructure	ICRISAT
Improved information management (includes barcoding system)	AfricaRice, Bioversity, CIMMYT, CIP, ICARDA, ICRISAT, IITA, ILRI
Potential duplicate identification	CIP
Improved herbarium (facilities, information...)	CIP, ICARDA, IRRI
Improved equipment	CIP, ICRISAT
Improved regeneration procedures	IITA
Improved seed health systems	CIMMYT, ILRI

275. As well as physical security, a high level of seed quality for both conservation and distribution purposes was ensured by seed health testing and monitoring of plant health during germplasm regeneration. With over 1.2 million samples taken through these and various other management procedures, most processing targets were significantly exceeded (by >50%) and even for the very challenging and labour-intensive clonal collections, a very high proportion of the target number of samples were processed (see Table 2 which is extracted from the GPG2 final report). The very few targets that were partially (< 50%) achieved reflect technical impediments such the lack of

³⁴ The Annual Report 2007-2010 of the CGIAR System-wide Genetic Resources Programme can be accessed at: http://www.sgrp.cgiar.org/sites/default/files/2010_SGRP_AR_2007-2010.pdf

suitable diagnostic methods or insufficient seed to meet the processing targets in time. A significant proportion (57%) of the processing activities involved documentation and safety back-up, reflecting a high priority given to reducing documentation backlogs and increasing the security of the collections through safety backup. 71.3% of the samples processed for safety duplication were sent to various host institutions for conventional safety duplication, with 28.7% being sent (as a 'safety triplicate') to the Svalbard Global Seed Vault in Norway.

Table 2. Centre-own upgrading: Total number of samples of accessions planned and processed per Centre and type of activity (*signifies additional task not in original plan; na = not applicable)

Type of Activity	Total planned for 3 years	Total processed in 3 years	Achievement (%)
AfricaRice			
Characterization	7,000	6,118	87%
Documentation	17,000	15,872	93%
Health testing	8,200	0	0%
Regeneration	6,000	7,008	117%
Safety backup	6,000	16,177	270%
Viability testing	6,000	6,000	100%
Total	50,200	51,175	102%
Bioversity			
Characterization	500	513	103%
Cryopreservation	250	244	98%
Health testing	120	99	83%
Regeneration	100	97	97%
Safety backup	483	680	141%
Total	1,453	1,633	112%
CIAT			
Characterization*	0	11,813	na
Documentation*	0	11,813	na
Health testing	7,815	14,242	182%
Packaging	26,728	20,630	77%
Regeneration	7,815	13,355	171%
Safety backup	32,669	21,874	67%
Viability testing	34,500	23,647	69%
Total	109,527	117,374	107%
CIMMYT			
Characterization	480	558	116%
Regeneration	20,468	26,061	127%
Safety backup*	36,867	182,702	496%
Viability testing	8,210	28,263	344%
Total	66,025	237,584	360%
CIP			
Characterization	500	510	102%
Cryopreservation	175	175	100%
Documentation	2,000	2,000	100%
Health testing	2,641	2,469	93%
<i>In vitro</i> introduction	308	350	114%
Safety backup	75	65	87%

Type of Activity	Total planned for 3 years	Total processed in 3 years	Achievement (%)
Total	5,699	5,569	98%
ICARDA			
Characterization	10,500	33,711	321%
Documentation	15,000	117,200	781%
Evaluation*	0	11,076	na
Health testing	15,000	20,993	140%
Regeneration	10,000	21,782	218%
Safety backup*	0	84,678	na
Storage	30,000	21,318	71%
Viability testing*	0	30,779	na
Total	80,500	341,537	424%
ICRISAT			
Characterization	11,500	11,570	101%
Documentation	76,500	89,956	118%
Health testing	21,000	29,361	140%
Processing	28,700	28,903	101%
Regeneration	14,800	23,487	159%
Safety backup	70,000	85,560	122%
Viability testing	16,200	17,770	110%
Total	238,700	286,607	120%
IITA			
Characterization	4,087	1,603	39%
Distribution	3,415	8,619	252%
Documentation	6,800	6,800	100%
Health testing	7,150	7,403	104%
<i>In vitro</i> introduction	2,000	993	50%
Packaging	4,850	5,779	119%
Processing	7,150	8,064	113%
Regeneration	4,883	6,119	125%
Safety backup	24,870	15,012	60%
Viability testing	4,850	5,418	112%
Total	70,055	65,810	94%
ILRI			
Characterization	2,900	2,354	81%
Documentation	11,535	13,197	114%
Health testing	2,400	2,695	112%
Regeneration	2,400	2,695	112%
Viability testing	1,700	2,297	135%
Total	20,935	23,238	111%
IRRI			
Characterization	16,500	18,027	109%
Documentation	62,000	83,943	135%
Total	78,500	101,970	130%
GRAND TOTAL	721,594	1,232,497	159%

276. Some illustrative highlights of individual Centre activities are given below, selected from the vast and diverse range of activities carried out by ten Centres on more than 35 crops:

AfricaRice: The entire rice collection was transferred from Côte d'Ivoire to Cotonou, Benin, where 6,000 accessions were processed through a new viability testing laboratory. 6,237 accessions were safety-duplicated at the USDA's National Center for Genetic Resources Preservation, in Fort Collins, Colorado, USA, and 9,940 accessions were sent to Svalbard, these figures exceeding targets by more than 200%. Health testing deferred because of equipment delays is now under way.

Bioversity International: 250 banana accessions were successfully cryopreserved by vitrification of excised meristems or proliferating meristem clumps. Frozen accessions numbering 40% more than the original target were stored in black-box safety backup at the Institut de Recherche pour le Développement (IRD) in Montpellier, France. Collection management and documentation were enhanced through use of optimized barcoding and inventory systems, and data on 360 accessions were made available to users online.

CIAT: Although limitations on seed availability impeded work on safety backup, 72% of the bean collection and 55% of the forage collection is now backed up in Svalbard, and targets were significantly exceeded for health testing, regeneration and processing for characterization and documentation. Upgrades to cold rooms and *in vitro* facilities have improved conservation conditions, and enhanced technologies such as barcoding and digital imagery have helped improve germplasm access and availability to users.

CIMMYT: Maize and wheat collections at the Centre have been brought towards the international standards expected by stakeholders, thanks to equipment and system upgrades, especially to inventory and seed health aspects. Backlogs were removed in regeneration, characterization, health and viability testing, documentation, and seed supply, resulting in all processing targets being exceeded.

CIP: Achievement of all targets has significantly enhanced the management of CIP mandate crops. 1,115 potato, 795 sweetpotato and 31 Andean root and tuber crop (ARTC) accessions were cleaned of viruses, and 528 sweetpotato accessions of endogenous bacteria. Attention to ARTC also included testing cryopreservation methods, introduction into *in vitro* culture, and conversion of duplicates into botanical seed. Genebank upgrades include increased cryopreservation capacity and use of barcoding.

ICARDA: Nearly 9,000 cereal accessions were processed into the active collection, exceeding the target tenfold. Thanks to new germination facilities, targets for regenerating and multiplying cereal, food legume and forage/range species were exceeded several-fold. 63,787 seed accessions were safety duplicated in Svalbard and the Centre distributed over 20,000 accessions to partners. A similar number were pathogen tested, the majority being cereals far in excess of targets, reflecting high user demand.

ICRISAT: Most GPG2 targets were achieved and substantially exceeded. Considerable progress was made in processing germplasm for cold room storage. Field regeneration resulted in a substantial increase in the base collection at Patancheru (107,115 accessions, representing 90% of the entire collection) and 43,000 seed samples were transferred to Svalbard. Infrastructural improvements enhanced the security of the germplasm collections, and barcoding increased the efficiency of collection management.

IITA: All targets were achieved in removing processing backlogs for some 6000 cowpea, Bambara groundnut and African yam bean accessions. Disease indexing targets for seed and clonal crops were exceeded. 68% of the cassava collection was transferred to *in vitro* storage, but a bottleneck was identified in responsiveness of yam to *in vitro* conservation. Provision of equipment allowed research to begin on cryopreserving cassava and banana, and introduction of barcoding enhanced management of seed and *in vitro* collections.

ILRI: Projects targets were exceeded in the reduction of backlogs in documentation, health testing, regeneration and viability testing. The activities benefited from improved information management systems and seed health facilities with enhanced biochemical and molecular

diagnostics. The project generated information and shared knowledge about the diversity of the in-trust forage collection.

IRRI: All targets were met or exceeded. A new long-term cold store was constructed with a doubled capacity of 220,000 accessions. A humidity-controlled herbarium of wild rice specimens was established. 16,411 cultivated and 1,616 wild rice accessions were characterized. Historical data entry was completed on characterization and distribution for 62,430 cultivated and 2,081 wild accessions.

Collective activities

277. GPG2 was a truly collaborative effort, with all participating Centres contributing to collective activities. Analysis of individual Centre contributions to the over 150 distinct GPG2 products shows that nine of the Centres contributed to between 70 and 90% of the products, with significant inputs coming from the other four Centres, other CGIAR initiatives³⁵ and non-CGIAR partner organizations.³⁶ The GPG2 products are a balanced mix of crop-specific and non-crop-specific, and range from technical guidelines and databases to reports, position papers and case studies. They will find application in technical training or teaching, as research resources and to support genebank decision-making and strategy development. The majority of the products are available on-line³⁷ or in other digital formats. The products are packaged under six Outputs, some highlights of which are described below.

Output 1: Uniform risk-management procedures developed and implemented in all CGIAR genebanks

278. Secure conservation is at the heart of the Centres' stewardship of their collections, and depends on accurate assessment and the appropriate management of risks. The adequacy of conservation technologies is key, and safety duplication to back up collections provides necessary insurance against a range of threats. Safety backup backlogs were substantially reduced in all Centres thanks to the Centre-own component of GPG2.

279. The development of risk-management guidelines to ensure the security, quality and availability of the in-trust collections was led by the CGIAR Internal Audit Unit (IAU), IRRI, CIAT and ILRI, with contributions from a Philippine national partner. A common framework for analyzing risks and a database of common risks, risk mitigation measures and contingency actions were identified, compiled and made available for public users. Current safety backup procedures were reviewed and analyzed, and recommendations on addressing various economic, technical and legal aspects and their corresponding risks were made available to the genebank community.

280. Particular attention was given to clonal crops which share a common set of risks relating to their conservation methodology. Experience in storing five clonal crops over the medium and long term was sufficiently documented to enable a baseline to be established for auditing and quality checking across CGIAR Centres, and to support technical decisions regarding conservation strategies. Cross-testing protocols are being examined for response uniformity in more than one location and a training manual to promote the conservation of clonal crops by CGIAR partners, including NARS will be published in the future. A strong network of collaborating scientists formed a Clonal Crops Task Force, which remains active

Output 2: Best practices for genebank management developed and implemented in the CGIAR Centres and made available to partners

281. The CGIAR System is committed ensuring the security, viability, health, genetic integrity and accessibility of its in-trust collections, including crops in common. As well as setting and applying

³⁵ CGIAR Programmes and Initiatives involved in GPG2 include: Capacity Strengthening, Education and Training Groups, the Central Advisory Service on Intellectual Property (CAS-IP), the Consortium for Spatial Information (CSI), the Generation Challenge Program (GCP), the Global Facilitation Unit for Underutilized Species (GFU), Internal Audit Unit (IAU), the International Centre for Underutilized Crops (ICUC), the Information and Communication Technologies and Knowledge Management (ICT-KM) Program, SGRP and SINGER.

³⁶ List available at http://sgrp.cgiar.org/sites/default/files/2010_SGRP_GPG2_Final_Report.pdf

³⁷ The products can be located on the following websites: <http://cropgenebank.sgrp.cgiar.org> and <http://www.sgrp.cgiar.org/>

best practices for high-quality collection management, it will contribute a knowledge base to guide partners in the development of a global conservation system. Most of the activities delivering this Output were coordinated by Bioversity and led by a scientist based at ILRI, with components led by CIMMYT, CIP and IRRI.

282. A knowledge base on genebank management issues – the Crop Genebank Knowledge base (CGKB) – was established for the purpose of sharing recommendations on best practices for nine crops with links to all GPG2 activities. Training materials were compiled and also created during the project (technical videos, flip books, photo albums) in consultation with the CGIAR Capacity Strengthening Community. Information on regulatory and best practice methods for transgene detection and crop regeneration was extracted from various databases where transgenic events released experimentally or commercially in all crops worldwide are reported, including information regarding crops such as maize, rice and potato.

283. Best practices were identified for genebank inventory management systems. Barcoding systems were reviewed and the Centres were assisted in implementation. A computerized decision-making tool to enhance the cost-effectiveness of managing genebank collections was tested and revised with data from five Centres and made available online. Analysis of the genetic similarity of duplicate samples within and among genebanks highlighted loss of genetic integrity, with implications for best practices in regeneration and seed handling practices.

Output 3: Unified protocols for locating and delivering germplasm and for sharing information on common crops in place at all CGIAR genebanks

284. Common systems and procedures will enhance the CGIAR System's ability to provide safe and ready access to the in-trust collections, by ensuring that accessions are free of pests and diseases, and that quality information is available to facilitate selection. A platform for collaborative efforts will include a one-stop entry point for information and ordering, and will provide leadership in working towards a global system.

285. The development of a platform of best practices for the safe movement of germplasm was led by CIMMYT in collaboration with CIP and plant health specialists from other Centres. A compendium of country regulations on pests and diseases was developed for guidelines concerning seed and clonal crops, and a System-wide review conducted of procedures for pathogen detection

286. The development of a 'one-stop-shop', single entry point for accessing material and information on the in-trust collections through SINGER was led by Bioversity in collaboration with documentation specialists at all Centres that have genebanks. Features such as map-based selection of germplasm, climatic data, downloadable datasets and direct links from passport data to the crop databases have been incorporated. A prototype germplasm-ordering system using SINGER data has been developed and is being supported through a help desk.

287. The development of crop-specific information systems linked to SINGER was led by ICARDA in close collaboration with the CGIAR genebanks holding collections of crops-in-common. Essential data required for cross-referencing accessions in different collections were defined, and new data templates developed. The resultant crop-specific registries provide a starting point for integration and rationalization among collections within and potentially beyond the CGIAR.

Output 4: Strategies and tools for enhancing knowledge on the diversity held in the in-trust collections

288. The capacity of the CGIAR to deliver global public goods and its comparative advantage within a global conservation system depend on both the completeness of the collections and the quality of related information. Thus, there is a need for a detailed understanding of the genetic diversity included in and missing from the collections, plus a need to fill critical gaps. Work on improving the completeness and quality of passport data was led by SINGER with the participation of all Centres. Other activities were led by CSI/IWMI and ICRISAT with the collaboration of several other Centres. Centre-own activities on documentation also contribute to this Output.

289. Collecting reports were assembled and passport data examined for completeness and reliability, linking the data to SINGER. Errors and gaps in georeferenced data were rectified. Analysis of phenotypic traits revealed environmentally unique areas where collecting had been limited and should be visited to obtain more representative and diverse samples for conservation and use. One such example related to sorghum from the Democratic Republic of the Congo.

290. An analysis protocol was developed for identifying basic ecogeographic gaps in the diversity of wild species and cultivated materials and applied to wild species from 10 gene pools. Patterns of demand for trait-specific germplasm in common/priority crops (chickpea, rice, maize, potato, banana, pigeonpea and sorghum) were surveyed across Centres, and for five of these crops (chickpea, rice, maize, potato and pigeonpea), needs were assessed for diversity and gap analysis based on morphological and agronomic traits and molecular markers.

Output 5: Recommendations for the wider involvement of CGIAR genebanks in addressing genetic and genomic stocks, associated biodiversity and underutilized species

291. This Output looks beyond the major mandate crops of the Centres to wider biodiversity playing an important role in agroecosystems and in crop improvement strategies. Thus, a holistic approach to biodiversity should take into account underutilized species, specialized collections, DNA and other genetic materials, plant pests and disease organisms, and other elements of associated diversity. Inventory and review of their status and availability will allow informed decision-making on their management within the CGIAR System, and facilitate access to external resources.

292. Activities explored the comparative advantages of the CGIAR in the conservation of wider biodiversity through surveys and inventories. Biodiversity led inventorying of genetic and genomic collections in collaboration with all Centres, the Generation Challenge Programme (GCP) and the CAS-IP. Through a workshop, procedures for managing, accessing and accessioning genetic stocks in publicly available collections were compiled and reviewed, with recommendation of policies and best practices for management (focusing on rice, wheat, barley, maize, chickpea, cassava and banana) and accessibility through a global system.

293. Work on microbial, fungal, insect and nematode collections led by IITA developed a database listing collections and their contents in CGIAR Centres and international repositories, plus an inventory of CGIAR experts curating collections. Work on neglected crops by the Global Facilitation Unit on Underutilized Plant Species (GFU) surveyed activities in CGIAR and national genebanks, providing information that has been integrated into an existing GFU database, making inputs to the development of models for enhancing the management of groups of neglected and underutilized species, assessing the benefits of these crops to communities, and identifying future research needs for this important sector of agricultural biodiversity.

Output 6: Mechanisms for improved collective action among CGIAR genebanks in the delivery of global public goods and promotion of international collaboration on conservation

294. Achieving this output requires an understanding of the components and functions of a global system for crop germplasm conservation and use, enhancing the CGIAR's capacity to contribute to the system by generating knowledge and technology and supporting national partners, and monitoring the CGIAR's performance to ensure the Centres' continued relevance and efficacy.

295. Activities were overseen by the GPG2 Project Coordinator in close consultation with the SGRP Coordinator, ICWG-GR Executive Committee, and the IAU, with strong links to all other GPG2 Activities. A sustainability plan was drafted to ensure long-lasting results from the investment in rehabilitating the collections and the Centres' capacity for meeting their in-trust commitments in the future. The plan incorporates aspects on promoting awareness and use of the in-trust collections (including redesigning the SGRP website, development of a public awareness strategy and activities at relevant international events), and strategic planning for research, and for enhancing human capacity.

296. In collaboration with national partners and stakeholders in Kenya, Morocco, the Philippines and Peru, opportunities and obstacles were examined for countries' participation in a global system,

particularly in the Multilateral System of the International Treaty. An exchange of concerns, experiences and ideas revealed how Centres and national programmes could work together to address challenges faced by national programmes, revealing common incentives and disincentives, with recommendations to address the latter.

297. Work on the development of a performance measurement system for the in-trust collections involved discussion among Centre genebank managers, CAS-IP and the Global Crop Diversity Trust. The exercise resulted in the development of a set of indicators drawing on and harmonizing GPG2 inputs and Global Crop Diversity Trust genebank performance indicators.

FRIDTJOF NANSEN INSTITUTE (FNI)

Important past project

298. The project ‘Beyond Access – Implementation of CBD in Developed Countries’ concerned the implementation of the CBD in national jurisdictions. The core task was to provide for technical-legal analysis of the implementation of relevant legal tools to achieve this major objective under the CBD. It was carried out together with the International Union for Conservation of Nature (IUCN).

INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS (ICARDA)

299. *Other activities:*

- ICARDA DG and staff contributed to 9 conferences related to biodiversity conservation (Brazil, Jordan, India, Egypt, etc) and presented oral presentations on “ICARDA role in promoting the conservation and sustainable use of dryland agrobiodiversity”.
- ICARDA attended the meeting of the “Biovision Alexandrina” in November 2010 and was chosen as a member of the steering and technical committees of the project “Arab Encyclopedia of Life” led by Bibliotheca Alexandrina in Egypt.
- The importance of conserving dryland agrobiodiversity was explained to more than 78 visitors to ICARDA, more than 240 school and university students and to around 160 farmers in Yemen, Jordan, Tunisia, etc.
- Production of two field guides for easy identification of *Medicago* and *Lathyrus* species from Central and West Asia and North Africa (CWANA) and Europe regions

INTERNATIONAL FEDERATION OF ORGANIC AGRICULTURE MOVEMENTS (IFOAM)

300. The International Federation of Organic Agriculture Movements (IFOAM) is the worldwide umbrella organization uniting over 750 member organizations and institutions in some 108 countries .

301. IFOAM’s activities on genetic resources are integrated into its biodiversity campaigns, international advocacy activities, conference and side event program, publications and training manuals, activism, standards and positions.

Biodiversity Campaigns

302. The IFOAM biodiversity and eco (functional)-intensification campaign “Powered by Nature” sets out to explain the science and practices behind resilient and high yielding organic systems that utilize rather than degrade biodiversity and ecological functions or ‘services’. Explaining how the strategic and sustainable use of biodiversity not only enhances system performance but also improves food security and livelihoods by improving affordability and accessibility is critical if effective systems for the world’s smallholders and the biodiversity they protect are to be realized on the ground.

303. Eco-intensification is of strategic importance to the international organic movement in that it can be used to explain why organic agriculture is able to produce food without chemicals and how by

working with nature more intelligently and intensively organic systems can be high yielding, sustainable and profitable.

Advocacy

304. As the umbrella organization for the international organic agriculture movement IFOAM has observer status at biodiversity related UN agencies: Food and Agriculture Organization (FAO), the Convention on Biological Diversity (CBD) and the United Nations Environment Program (UNEP). IFOAM has actively collaborated with the Commission on Genetic Resources for Food and Agriculture from 2005.

Biodiversity Conferences & Side Events

305. IFOAM has a history of delivering events that showcase the biodiversity of organic farmers – an important role given the continuous narrowing of the agricultural gene pool.

2011 – IFOAM is organising, in collaboration with the Swiss government, Bioversity international and the Research Institute of Organic Agriculture (FIBL) the Side Event “Eco-intensification: Does organic agriculture contribute to the sustainable use of genetic resources for better adaptation to climate change and for food security?” at the CGRFA 13th Session.

2009 - “Growing genetic resources in organic farming”. In collaboration with the Swiss government, FAO and FIBL, IFOAM organized a Side event at the Twelfth Regular Session of the Commission on Genetic Resources for Food and Agriculture.

2009 – The 1st International IFOAM Conference on Organic Animal and Plant Breeding (‘BREEDING DIVERSITY’). Organized by IFOAM and held in Santa Fe, USA, it brought together animal and plant breeders, seed savers, producers, consumers, governments and intergovernmental agencies, researchers and universities from around the globe.

2008 – Planet Diversity. Co-organized by IFOAM and the World Congress on the future of food and agriculture, held in Bonn Germany, during the UN-Convention on Biodiversity and the Biosafety Protocol negotiations.

2004 - 3rd International Conference on Biodiversity. Organised by IFOAM and UNEP and held in Nairobi, Kenya.

2004 - 1st International Conference on Organic Seeds. Organized by IFOAM in conjunction with the FAO and the International Seed Federation (ISF), took place at FAO Headquarters in Rome.

Biodiversity Publications and Training Manuals

306. 2010 - TEEB (The Economics of Ecosystems and Biodiversity). IFOAM was a contributing author to Chapter 9 (Certification and Labeling) of the TEEB Report for Local & Regional Policy Makers Released at the UN Biodiversity Conference in Japan (CoP10). The report illustrates the leadership the organic movement has provided in establishing a production and marketing system based on the sustainable use of biodiversity.

2009 - FOAM Guide to Biodiversity and Landscape Quality in Organic Agriculture. The publication provides practical working examples and suggestions for farmers and advisers. Proven innovations from a wide variety of farms, traditions and agro-ecological zones are described.

2007 – Overview of World Production and Marketing of Organic Wild Collected Products. Gives an overview of organic and other standards that relate to wild collection and provides data and background information about collection and marketing of certified organic wild collected products.

2005 - IFOAM training manual on seed saving. The manual instructs trainers on how to set up training activities on seed saving techniques of many agricultural plant varieties.

2004 – Proceedings of the 3rd International IFOAM Conference on Biodiversity.

2004 – Proceedings of the 1st International Conference on Organic Seeds.

2002 - Organic Agriculture and Biodiversity. A comprehensive brochure and two-page leaflet that outlines the positive relationship between organic production and biodiversity conservation.

Activism

307. IFOAM took part at the world's first legal challenge to a biopiracy patent. IFOAM, together with the Indian environmentalist Vandana Shiva and Magda Aelvoet, former president of the Greens in the European Parliament, promoted and won a legal case at the European Patent Office for revoking a patent on a fungicidal product from seeds of the Neem tree, which is indigenous to the Indian subcontinent and whose characteristics have been recognized by farmers over millennia

PRACTICAL ACTION

308. Practical Action is a specialist international development NGO founded in 1966. We work on a range of technological issues with and in support of communities in developing countries, from regional offices in East Africa (Nairobi), Southern Africa (Harare), South America (Lima) and South Asia (Colombo). In addition there are national offices in Bangladesh, Nepal and Sudan. Our headquarters are in the UK.

309. We have worked on agricultural biodiversity issues for more than 20 years with the organisations of smallholder and peasant farmers, pastoralists, artisanal fisherfolk and other small-scale food providers, who, over countless generations, have developed, *in situ*, the agricultural biodiversity that feeds the world. The focus of our work has been to support and defend, through normative processes, practical projects and advocacy, their biodiverse, resilient, ecological production systems, which both generate and depend upon agricultural biodiversity and are an essential component of food sovereignty.

310. In support of normative work, we have been active participants in the work of the Commission (CGRFA) since its inception in 1993, and the development and implementation of the International Seed Treaty (IT PGRFA) including participation in the work of its Governing Body. We are principal participants in the Civil Society lobby – the CBD Alliance – on agricultural biodiversity at the Convention on Biological Diversity (CBD) and have contributed to the development of the joint CBD/FAO programme of work. We were one of the six NGO governing bureau members of the World Bank/UN sponsored International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD). We participate in relevant Civil Society processes that defend agricultural biodiversity through national, regional and international networks including the UK Food Group and the UK Agricultural Biodiversity Coalition, the European Peasant Seed network “Let's Liberate Diversity”, the EuroAfrica project that works with the African farmers' regional networks, the More and Better network and the IPC for food sovereignty.

311. In our practical work there are many examples of our work with local communities in defence of agricultural biodiversity. We support Andean Alpaca keepers defending their high altitude, potato production systems, which sustain potato biodiversity in its centre of origin, through work that strengthens their livelihoods in the face of climate change. We have worked with pastoralist communities in Kenya to defend their livelihoods which depend on managing their diverse livestock breeds across very biodiverse semi-arid lands and their diverse sorghum varieties, which provide much of their grain. With coastal communities threatened by the incursion of industrial agriculture and fisheries in Sri Lanka we support their access to and management of biodiverse inland and coastal fisheries and help defend their highly biodiverse rice production systems. In Bangladesh we support local producers provide a wide range of vegetables in gardens which float on flood waters. In Zimbabwe we have supported pioneering work in defending crop biodiversity through seed fairs and other exchanges that increase the agricultural biodiversity maintained and developed by small-scale producers.

UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

312. UNEP's work relevant to the prioritized themes of the Commission on Genetic Resources for Food and Agriculture (CGRFA) Thirteenth Regular Session builds on the distinctive mix of competencies and the framework of activities and experience the agency has accrued over years of work in the fields of biodiversity conservation, science and knowledge, sustainable use of natural

resources and land management, environmental governance, including development and implementation of access and benefit sharing (ABS) policies, and climate change adaptation.

313. Biodiversity conservation is a cornerstone of UNEP's Programme of Work. The focus of UNEP's work includes the role of biodiversity for food security and ecosystem resilience, economic valuation of biodiversity and ecosystem services, the role of protected areas, ecological corridors and landscape connectivity to help biodiversity adapt to climate change, providing an enabling environment for sharing benefits of conservation and sustainable use of biodiversity (see paragraphs 259 to 260 for additional relevant information) and other threats, support to biological-related Multilateral Environmental Agreements (MEAs), and capacity building for countries to implement commitments hereunder.

314. In the area of agricultural biodiversity, UNEP's teams work with increasing commitment towards improving the sustainability of agro-ecosystems. UNEP is currently engaged as a lead or principal partner in several global initiatives focusing on the medium- to long-term response to the food crisis and to the future of agriculture and environment; sustainability of responses; conservation and sustainable use of plant and animal genetic resources; genetic resources information management; the role of agricultural biodiversity for overall biodiversity maintenance and ecosystem function; increased food security and improved well-being in rural communities and the linkages to the climate change challenge; mainstreaming agricultural biodiversity conservation into other sectors (health, nutrition, and education), as well as on assisting development of access and benefit sharing provisions under the Convention on Biological Diversity (CBD) ABS process.

315. UNEP has provided support to 34 countries in Africa, Asia and Latin America in conservation and sustainable use of biodiversity within agriculture productive landscapes. The total budget invested in partner countries through these projects is US\$ 157 million. GEF contributions have accounted for US\$ 54 million of this amount, with the other US\$103 million coming from co-financing arrangements. Detailed information on specific projects can be found on: http://www.unep.org/dgef/Portals/43/AgBD_publication_FINAL.pdf

316. UNEP has been working on this area in partnership with international organizations with specialized expertise, particularly the Consultative Group for International Agricultural Research (CGIAR) Centres, including Bioversity International, International Centre for Tropical Agriculture – Tropical Soil Biology and Fertility Institute (CIAT-TSBF) and International Livestock Research Institute (ILRI), the Platform for Agrobiodiversity Research and FAO.

WORLD AGROFORESTRY CENTRE

Cooperation with the Convention on Biological Diversity

317. Under the three CBD goals, World Agroforestry Centre has contributed to knowledge for development and implementation of regional *ex situ*, *circa situ* and *in situ* conservation strategies appropriate for maintaining agroforestry tree genetic resources, in order to ensure the sustainability of farm forestry. Long term conservation efforts and safety duplications under 'black-box' approach with external genebanks have been undertaken with Kunming genebank of China and Svalbard global Seed Vault. Field genebanks of high value tree species are established with partners when funds are available.

Cooperation with other international instruments and organizations

318. World Agroforestry Centre works with global development agencies, government services, other international non-governmental organizations and policy makers to advocate use of participatory tree domestication techniques that will contribute to the sustainable use and conservation of tree genetic resources. For example, World Agroforestry Centre collaborates with Forest and Landscape of Denmark (FLD), Scottish Crop Research Institute (SCRI), Vi agroforestry, NOVELLA project partners, etc to promote conservation, evaluation, documentation, genetic enhancement, plant breeding and seed multiplication of agroforestry genetic resources.

WORLD TRADE ORGANIZATION (WTO)

319. Certain WTO agreements are of direct relevance to the prioritized themes of the Thirteenth Regular Session of the FAO Commission on Genetic Resources for Food and Agriculture. In addition, the WTO has recently contributed, through its participation in the Standards and Trade Development Facility (STDF), to capacity-building activities on climate change and invasive alien species (IAS).

320. Certain WTO agreements touch upon the question of genetic resources and biodiversity. Firstly, the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) allows members to adopt measures necessary for the protection of human, animal or plant life or health that are not inconsistent with the provisions of the agreement. Accordingly, within the limits set by the SPS Agreement, WTO members can enact measures that are designed to protect their genetic resources from threats arising from animal or plant diseases, or from invasive alien species. Any SPS measure which may directly or indirectly affect international trade can be discussed, alongside with other issues related to the implementation of the SPS Agreement, in the Committee on Sanitary and Phytosanitary Measures. This committee normally meets three times per year and has considered, for example, the risks to forests in North America from the introduction of the Asian Gypsy moth.

321. Secondly, the Agreement on the Trade-related Aspects of Intellectual Property Rights (TRIPS Agreement) is relevant in that its Article 27.3(b) gives WTO Members the option to exclude from patentability plant and animal inventions, while obliging the availability of patents for microorganisms and microbiological and non-biological processes for the production of plants and animals. In addition, Members are obliged to provide, at a minimum, an effective sui generis system for the protection of plant varieties. This provision is under review in the Council for TRIPS, as mandated by the agreement itself. Furthermore, the relationship between the TRIPS Agreement and the Convention on Biological Diversity (CBD) is an issue identified for further work in paragraph 19 of the 2001 Doha Ministerial Declaration, and is being discussed in a consultative process chaired by the Director-General of the WTO by a group of delegations representing the various positions on the matter (for the latest update, please see report of the Director-General of 21 April 2011 (WT/GC/W/633, TN/C/W/61)).

322. The WTO forms part of the Standards and Trade Development Facility (STDF), a joint initiative in capacity building and technical cooperation aimed at raising awareness on the importance of sanitary and phytosanitary (SPS) issues, increasing coordination in the provision of SPS-related assistance, and mobilizing resources to assist developing countries enhance their capacity to meet SPS standards. (Other STDF partners include FAO, the World Organization for Animal Health (OIE), WHO and the World Bank.) As an STDF partner, the WTO has recently contributed to and participated in capacity-building activities on climate change and invasive alien species (IAS), both of which are themes relevant to the conservation and sustainable use of genetic resources.

323. Both the WTO and the STDF form part of the Inter-Agency Liaison Group on Invasive Alien Species, which held its second meeting in February 2011. Based on the recommendations of this meeting, the STDF is currently organizing a seminar on international trade and IAS. The seminar, scheduled for March or June 2012, will seek to (i) raise awareness on the detrimental effect of the spread of IAS and the associated economic and environmental damages and on the contribution of effective SPS systems to limit these damages, and (ii) review technical assistance initiatives which aim to build national and/or regional capacities to manage the introduction and establishment of IAS.

324. The STDF and the World Bank's Development Research Group organized jointly, in September 2009, a seminar on "Climate Change and Agriculture Trade: Risks and Responses". The seminar sought to increase awareness about the implications of climate change for SPS risks, and its specific objectives were to (i) present new research on the relationship between climate change and global trade flows, as well as the implications for food safety, animal and plant health, (ii) identify SPS-related challenges posed by climate change, and (iii) discuss the implications and priorities for SPS capacity-building. STDF Briefing Note No. 2 summarizes the main discussions and conclusions of the seminar, and the STDF is currently finalizing its full report for publication.