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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

WORKING GROUP ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Third Session

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REPORTS FROM ORGANIZATIONS

CAPACITY-BUILDING ACTIVITIES THAT SUPPORT THE UTILIZATION OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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ANNEX 1: CAPACITY-BUILDING ACTIVITIES OF THE FUTURE HARVEST CENTRES THAT SUPPORT THE UTILIZATION OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

ANNEX 2: SEARICE PROGRAMMES, PROJECTS AND ACTIVITIES

1. INTRODUCTION

1. The Commission on Genetic Resources for Food and Agriculture, at its Tenth Regular Session in 2004, requested the Intergovernmental Technical Working Group on Plant Genetic Resources to provide guidance on initiatives for capacity building to support the utilization of plant genetic resources for food and agriculture, through seed systems, plant breeding and genetic enhancement, including inviting information on the relevant activities of the CGIAR and other relevant stakeholders.

2. In order to assist the Working Group, the Food and Agriculture Organization of the United Nations (FAO), contacted a number of organizations requesting them to provide information on activities relevant to capacity building to support the utilization of plant genetic resources. A number of organizations responded to FAO's request. This document provides an overview of the reports provided. FAO has limited itself to compiling the reports, as submitted. Each report is fully the responsibility of the organization submitting it.

2. REPORTS FROM ORGANIZATIONS

A. THE FUTURE HARVEST CENTRES OF THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH (CGIAR)

3. This report was prepared by the System-wide Genetic Resources Programme (SGRP) of the Consultative Group on International Agricultural Research (CGIAR). It consolidates information provided by the Future Harvest Centres that have capacity-building activities on plant genetic resources and also includes the activities of the GFAR Global Facilitation Unit for Underutilized Species (GFU-US), which is hosted by IPGRI.

4. The report presents an overview of the capacity-building activities of the Future Harvest Centres relevant to the six priority areas for the utilization of plant genetic resources as laid out in the *Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture* (GPA). The information provided covers the period 2001 to present. It is not intended to be fully comprehensive, but to highlight the range and focus of the CGIAR's capacity-building activities by drawing on data from individual Centres where this was available and demonstrative. Centre web sites hold information about training and other capacity-building activities and more details can be obtained directly from the individual Centre training units.

Capacity-building activities

5. Centres engage in a range of capacity-building activities at global, regional and national levels relative to the improved utilization of plant genetic resources for food and agriculture (PGRFA). Enhancing capacity for research and development in agriculture, forestry and fisheries in developing countries is an important component of Centre programmes. Primarily directed at national programme scientists, Centre capacity-building activities also involve extension and development specialists, staff of non-governmental organizations, farmers and local communities.

6. The primary way by which the Centres support capacity-building, is through courses and workshops involving groups of trainees, as well as individual training in the form of thesis research or field or laboratory study. In addition, the Centres provide opportunities for national scientists and other partners to make use of their laboratory and field facilities. They also produce a variety of guidelines, manuals and other publications, including specialized teaching materials that are used in training events or made available to national programmes and other stakeholders as aids in building capacity. More details about these various types of capacity-building relative to the GPA priority activities on the utilization of PGRFA are given below. The information provided covers also the capacity-building activities on underutilized species by the GFU-US at IPGRI.

Training courses and individual training opportunities

7. Over the past five years, the Centres have provided training in the form of group courses and workshops, thesis research and individual field and laboratory study as well as through distance learning. Many of the courses and workshops are held on a regular basis and announcements for these as well as of opportunities for research are posted on Centre web sites. The training has been provided to scientists from national agricultural research institutes and universities, extension and development specialists, NGOs, local communities and farmers. The subject of the training covers a range of topics including characterization, crop improvement and production, integrated pest management, post-harvest technologies and marketing strategies for under-utilized species, and contribute to all six of the GPA's priority activities on the utilization of PGRFA.

8. The training has been conducted primarily at Centres' headquarters, although several Centres regularly hold 'off site' training events in other countries and regions, for example CIMMYT (Centro Internacional de Mejoramiento de Maiz y Trigo), IITA (International Institute of Tropical Agriculture) and IPGRI. Generally the training concerns major crops of global or regional importance. However, CIP (Centro Internacional de la Papa) and IPGRI, including the GFU-US, have conducted courses and workshops on neglected and under-utilized species. The language of training is normally that of the region in which the training was conducted and typically English, French, or Spanish. Of the 51 group courses or workshops for which information on trainee gender was available, an average of approximately 32% of the participants, were women.

9. Annex 1-Table 1 presents information on courses and workshops for the period 2001 – 2005 available from 5 Centres. The subject of the training has been categorized by the 6 priority activities on PGRFA utilization in the GPA (chapters 9 to 14) and further disaggregated according to the topic areas as stated under the capacity-building section in the respective chapters.

10. Of the 130 courses/workshops analyzed, the majority (42%) relate to GPA priority activity 11 "Promoting sustainable agriculture through diversification of crop production and broader diversity in Crops". Most of the courses relating to this GPA priority fell under the topic area 'strategic use of a range of varieties'. Approximately 15% of the 130 courses/workshops concerned GPA priorities 9, 10 and 13. Since, in large part, Centre capacity-building activities concern crops that are mainstream in their research agendas, i.e. crops of global and regional importance, there are correspondingly fewer training activities specific to underutilized species.

11. Annex 1 - Table 2 presents information on the individual training provided by a selection of Centres (CIP, ICRISAT, IITA, IPGRI and relative to forage species by the International Livestock Research Institute, ILRI) between 2001 and 2005. Again, the information is categorized by GPA priority activities on PGRFA utilization (9 to 14).

12. Over the five-year period approximately 450 trainees undertook thesis research or other forms of individual training. The training related primarily to GPA priority activities 9, 11 and 12: "Expanding the characterization and number of core collections to facilitate use"; "Promoting sustainable agriculture through diversification of crop production and broader diversity in crops"; and "Promoting the development and commercialization of under-utilized crops and species". The majority of trainees (230) undertook thesis research and the remainder (221) followed on-site training, including field or laboratory research. Of the total number of students conducting thesis research, 40% were women. For those who undertook field or laboratory study, and other forms of on-site training, 70% were male and 30% female.

13. The topics of the thesis research and other forms of individual training span a range of subjects relevant to the GPA priority activities on PGRFA utilization, including genetic diversity studies, morphological and molecular characterization, breeding of specific species, screening of specific species for resistance to diseases, the linking of crop diversity with food traditions, comparative value

of crop varieties, and the social and cultural factors affecting the management of genetic diversity on farm, and many more. Again, generally the training has been on crops of global or regional importance, although some of the individual training undertaken at CIP and IPGRI focused on underutilized species.

Training materials (publications and other products)

14. The Centres have produced numerous publications that facilitate capacity-building in the area of the utilization of plant genetic resources. These materials range from guidelines, handbooks and manuals to self-teaching aides including on-line/distance learning modules. These training materials and publications cover topics such as seed production, participatory research methods, community-based seed production strategies, base-broadening methods, rules and regulations for the safe movement of germplasm, molecular marker techniques for germplasm evaluation, marketing strategies for underutilized species, descriptors for crop characterization, etc. Many of these publications and teaching materials are available on Centre web sites.

15. Centre information systems and databases on PGRFA also contribute to capacity-building. For example, the System-wide Information Network for Genetic Resources – SINGER – provides access to data on the collections of plant genetic resources that the Centres hold in trust under agreements with FAO. Centres have also developed specialized databases, for example the CIP database on native and wild potato species and the ILRI database of forage germplasm suited to the tropics that aid and guide NARS and other stakeholders in their research.

Capacity-building through assistance with facilities and equipment

16. The Centres are also facilitating capacity-building through providing access to facilities and equipment. Centres' laboratories and field facilities are available to visiting scientists and to partners in collaborative projects, as well as for use by NARS, for example in the case of molecular laboratories. In the context of collaborative projects, Centres have assisted national programmes and other partners to establish facilities or upgrade their research equipment.

B. THE WORLD BANK

17. Between 1988 and the end of FY04 the World Bank approved biodiversity investments totalling more than US$4.7 billion (includes cofinancing and GEF investments as well as IBRD/IDA) apportioned over approximately 426 projects from 1988 to 2004. The World Bank has invested in 200 biodiversity-related projects since 1999, and over 100 biodiversity-related projects are in the pipeline for 2004 and beyond.

18. Many of the World Bank's biodiversity-related projects are either fully or partially financed by GEF funding. In 2004 nine new projects were approved by GEF Council for financing with the World Bank as the implementing agency. Six of the projects are fully GEF funded and three co-financed. In the co-financing arrangements the World Bank lending focuses on agricultural productivity and rural livelihoods, while the GEF input supports the environmental and conservation aspects of the projects. Four of the projects are in Latin America, three in the Europe and Central Asia region and the remaining three in the Sub-Saharan Africa region. All of the nine projects address both the development of sustainable rural livelihoods and the promotion of sustainable natural resource management. The balance between the two elements varies from region to region. In the Africa region the emphasis is on support to sustainable rural livelihoods through integrated production systems, in Europe and Central Asia the focus is more towards natural resource conservation with community management and in Latin America the project focus is more mixed depending on the country and specific area. Short descriptions of the projects are presented below.

GEF-World Bank projects approved in 2004 with agro-biodiversity components

- **Second Rural Poverty, Natural Resources Management and Consolidation of the Mesoamerican Biological Corridor Project, Panama**
  The project development objective is to improve local governance and increase investment in poor rural areas for sustainable development. Achieving this objective would have a significant impact on: (1) employment and income generation, (2) delivery of municipal services and provision of social and economic infrastructure, (3) sustainable management of natural resources and environmental protection, (4) community participation in planning and local investments decision-making in allocating public funds for local development, and (5) improvement of local revenue mobilization and the fiscal transfer system (local taxes and user fees).

  The project would increase the coverage and depth of the ongoing Rural Poverty and Natural Resources (RPNR) Project and the Panama Mesoamerican Biological Corridor (PAMBC) Project in Panama and would contribute to three high priorities for the country's social and economic development: (1) rural poverty reduction; (2) natural resource conservation, management and environmental protection; and (3) local government strengthening. The project would support the first phase of the GOP ten years National Local Governance Strengthening Program. A parallel Global Environmental Fund (GEF) project now under preparation will be closely linked to this operation and will finance the global incremental costs of the environmental parts of these linked operations.

- **Western Kenya Integrated Ecosystem Management, Kenya**
  The overall goal for this project is to assist farmers in Western Kenya to adopt and implement sustainable land management strategies that enhance the productivity of the land while conserving soil, land, and biodiversity in addition to capturing local, national and global environmental benefits. The key objectives of the project are to reverse land degradation and promote income generating activities for rural farmers in western Kenya, increase C sequestration in soils and vegetation in the agricultural landscapes of western Kenya, contribute to reducing pollutant loads into an degrading international water body (Lake Victoria), and reduce the loss of biodiversity.

- **Community Watershed Development, Tajikistan**
  The global objectives would entail protection of globally significant mountain ecosystems by mainstreaming sustainable land use and biodiversity conservation considerations within agricultural and associated rural investment decisions. This integrated management approach would also provide replicable models for comparable areas throughout the country.

- **Dashtidzhum Biodiversity Conservation and Risk Mitigation Project, Tajikistan**
  The global objective is to demonstrate and provide for replication of in-situ conservation of globally significant biodiversity of Dashtidzhum Zakaznik. In support of this, the project will assist in (i) supporting protected areas management planning and monitoring activities; (ii) strengthening capacity to protect globally important flora and fauna species and ecosystems; (iii) supporting local population in Zakaznik surroundings to adopt environmentally friendly economic activities compatible with biodiversity conservation objectives; (iv) raising public awareness on conservation issues; and (v) involving local communities and NGOs in the decision making process.

- **Integrated Agro-Ecosystem Management in the North-Northwestern Fluminense (State of Rio de Janeiro), Brazil**
  The project will increase and sustain smallholder agricultural production, productivity and farm incomes and assist in the sustainable use of natural resources by promoting the adoption

of sustainable land and water management, at the microcatchment level with full involvement of the farming community. It will also address threats to biodiversity of global importance, enhance carbon sequestration in the agricultural landscape, and reverse land degradation in public and/or fragile lands. PDF-B under preparation and commit presentation expected in FY04.

- **Ecosystem Restoration of Riparian Forests in Sao Paulo, Brazil**
  The objective of this project is to foster development of adequate tools, mechanisms and methodologies for each region in the State, aiming to facilitate and encourage future large scale restoration of riparian forests, in order to: (a) provide support for biodiversity conservation in São Paulo biomes (Atlantic Forest and Cerrado) through implementation of riparian forest corridors as a means to address the threat to biodiversity posed by forest fragmentation; (b) decrease, through restoration of degraded lands, sedimentation processes in reservoirs, rivers, water springs, headwater and recharge areas, for better quality and quantity of water resources; and (c) reduce local rural poverty through creation of ways to obtain financial resources derived from environmental services rendered by riparian forests.

- **Integrated Ecosystem Management, Uruguay**
  The objective of the combined IBRD/GEF project is to promote the adoption of integrated production systems in agricultural and livestock landscapes to increase productivity within a context of holistic ecosystem and natural resources management while conserving soils, water, rangelands, and biodiversity. IBRD will finance the productive and competitive components related to agricultural crop production and livestock development. The GEF component will finance the incremental costs required to restore or improve the capacity of the productive rural landscape to maintain and improve ecological processes and conserve biodiversity. From the perspective of generation of global benefits, the project will promote the adoption of multiple-use land use practices that conserve biodiversity outside protected areas within a framework of integrated ecosystem management.

- **Agricultural Rehabilitation and Support Project (PRASAB) - Support for Sustainable Land Management, Burundi**
  This project will cover the incremental costs associated with the restoration of certain degraded lands, the development of community and national strategies related to the sustainable use of natural resources in certain wetlands and swamp areas in Burundi and will promote an integrated approach of watersheds and wetlands management. The program will support sustainable approaches to raising the productivity and improving the resource base on which the rural poor dependent with specific interventions relating to the promotion of integrated ecosystem management approaches in soil and land management and the development of a watershed management framework for the use of certain swamps and marshes.

- **Community-based Integrated Natural Resources Management Project in Okyeman, Ghana**
  The objective of the proposed project is to enhance biodiversity conservation and sustainable use of renewable natural resources in Okyeman through community-based integrated natural resource management approaches. To enhance biodiversity conservation and sustainable use of renewable natural resources in Okyeman through community based integrated natural resources management approaches. Specific Objectives: A. To improve the status of forest and wildlife resources in Okyeman through better management and minimisation of current threats.B.To establish Okyeman forest Resources Database. C. To enhance the development and implementation of local policies and regulations for natural resource management. D. To establish an Environmental Awareness Programme. E. To improve Local Economic development and improved livelihood.

C. TROPICAL AGRICULTURAL RESEARCH AND HIGHER EDUCATION CENTER (CATIE)

19. CATIE is a regional Latin American Center dedicated to research and graduate education in agriculture and agroforestry as well as the management, conservation and sustainable use of natural resources. In 1976, CATIE founded a Plant Genetic Resources (PGR) Unit, with technical and financial support from the Federal Ministry for Economic Cooperation and Development (BMZ) through the German Society for Technical Cooperation (GTZ), for the conservation, development and use of the germplasm collections that were initiated in the 1950´s, principally with perennial crops. CATIE's collections of coffee (*Coffea* spp.), cacao (*Theobroma cacao*), peach palm (*Bactris gasipaes*), fruit trees (*Sapotaceae* family), sweet pepper (*Capsicum* spp.), and squash (*Cucurbita* spp.) form part of the registry of base collections that were established by the International Board for Plant Genetic Resources (IBPGR) in the seventies.

20. In May 2004, CATIE joined the international network of *ex situ* collections of the CGIAR by placing its field and orthodox seed collections under the auspices of FAO. The field collections include a total of 4430 accessions composed of the following collections of major importance: coffee (*Coffea* spp.; 1848 accessions); cacao (*Theobroma* & *Herrania* spp.; 765 accessions); peach palm (*Bactris gasipaes*; 618 accessions); fruit trees of the *Sapotaceae* family (*Pouteria* spp. - 110 accessions; *Manilkara zapota*. – 72 accessions), and annatto (*Bixa orellana*; 103 accessions), among others. The orthodox seed collections comprise a total of 5712 accessions, out of which the squash (*Cucurbita* spp.; 2001 accessions), sweet pepper (*Capsicum* spp.; 1103 accessions), and tomato (*Lycopersicon* spp.; 472 accessions) collections are of regional and worldwide importance.

21. Through the newly formed (2003) Thematic Group 'Management and Sustainable Use of Plant Genetic Resources', CATIE is promoting the conservation, characterization and utilization of germplasm held in trust for the benefit of farmers in its mandate region and beyond.

22. Specific major activities include:

- **Improvement of the international cacao collection**
  Fingerprinting activities within and among accessions using SSR analyses are on-going. Based on these studies, off-type trees will be reclassified if found valuable and duplicates eliminated. Verified true-to-type trees are being labelled with the name of the respective clone, the field plot and the tree number per accession. A strategic introduction of new promising clones through the intermediate quarantine station of the University of Reading, UK and other sources is currently taking place to enrich the genetic diversity of the cacao collection. The old collection has been renovated and relocated to two new sites, where each genotype is represented by three clonal trees. Selected and field tested Monilia- and Phytophthora-resistant high-yielding cacao genotypes, which were generated by CATIE in a comprehensive breeding programme based on the cacao collection, are now being mass-propagated to initiate regional field trials in Central and South America. As funding sources we would like to acknowledge CABI, CFC, USDA and WCF.

- **International coffee collection**
  CATIE's coffee collection is old and faces problems of genetic erosion due to soil compaction (cemented soil layers at 30 – 80 cm depth), drainage problems, and lack of proper intensive management. The wild genotypes, mostly from Ethiopia and Yemen are especially under threat of genetic erosion as revealed by recently conducted inventories. CATIE has proposed a renovation of the entire coffee collection to be relocated to a new sloping site with excellent physical soil structure and drainage. Renovation will be done through vegetative reproduction techniques over the course of six years. This is an ambitious endeavour for which external funding is needed. CATIE researchers are proposing the establishment of two separate plots, one for the base collection (mainly wild genotypes from Ethiopia and Yemen) and the other for the active collection, thus, allowing the provision of appropriate management of shade,

fertilizer application, pruning, etc. to both collections. For the renovation process the following priority has been established: (1) wild genotypes, (2) selections and landraces, and (3) hybrids. In an effort to broaden the genetic base of the currently used commercial coffee varieties, nineteen F1 coffee hybrids, some of them with high cup quality, disease resistance and competitive yield - developed under a collaborative breeding programme involving CATIE, CIRAD and PROMECAFE -, were mass-propagated in CATIE's biotechnology laboratory for on-farm evaluation in Costa Rica. A new research proposal on "Molecular Markers for Plant Architecture in Arabica Coffee and Establishment of Provenance Trials for Quality Assessment for the Specialty Coffee Market" has been developed in collaboration with CABI and USDA and submitted for funding.

Other collections

The *Physalis* collection comprising 92 accessions has been largely (87%) regenerated. Exchange and graduate students' theses in the field of morphological and molecular characterization of this native species have added significant value to this regionally important collection. The native fruit tree collection of species of the Sapotaceae family is under severe threat of genetic erosion due to various factors. Renovation and relocation of this collection has started. Continuous efforts are being made to obtain funding for the regeneration of those accessions of the *Capsicum*, *Cucurbita* and *Lycopersicon* collections, which present low seed quantities and/or low germination rates. This would enable us to make a larger proportion of these collections available for potential users.

- **Germplasm distribution**

  During the past two years, there has been a significant increase in germplasm distribution. The total number of samples of seed or vegetative material distributed has been as follows: 1999 (17 samples); 2000 (16); 2001 (9); 2002 (70); 2003 (231); 2004 (417). In 2003 and 2004, 19 shipments comprising samples of 385 accessions of orthodox seeds were made. *Cucurbita* spp. was in highest demand (72%), followed by *Physalis* spp. (10%), *Lycopersicon* (5%) and *Capsicum* (3%). During the same period, 32 shipments, comprising samples of 263 accessions of recalcitrant species, were processed. In highest demand was coffee (50%), followed by cacao (21%), fruit trees and nuts (14%), peach palm (5%), cassava (5%), and *Psidium* spp. (3%). In this period, the recipients of the seed samples were: companies (38%), growers (15%), universities (13%), national research institutions (12%), international research institutions (12%), NGOs (6%), projects (5%). The top five recipient countries were: Costa Rica (34%), Thailand (31%), France (10%), El Salvador (7%), Germany (7%).

- **Promoting the domestication and development of under-utilized native species**

  Native *Vaccinium* species are found at high elevation (2000 – 3000 m) in the Andes (Venezuela, Colombia, Ecuador) and the Talamanca mountain range in Costa Rica. These are adapted to poor soil conditions and colonize bare land. The domestication of the 'Andean' blueberry with its antioxidant properties would offer highland farmers an alternative crop to the traditionally used blackberry and would provide them with an additional source of healthy food and income. A proposal to jointly characterize and domesticate the Andean blueberry has been developed among research institutions of Colombia, Venezuela and Costa Rica (CATIE).

- **Support to small-scale farmers and indigenous groups**

  CATIE's plant genetic resources group is supporting small-scale farmers and indigenous groups within Costa Rica through the provision of seed samples of grain, vegetable and root and tuber crops as well as cacao germplasm, thus contributing to improved food security, a more balanced diet and diversified production systems as a solid basis of sustainable agriculture. On-farm management and conservation of these plant genetic resources are encouraged as a way of complementing CATIE's *ex situ* conservation efforts.

- **Policy issues in agricultural biotechnology, biosafety and biodiversity conservation and reactivation of regional PGR network**
  IICA, OIRSA and CATIE have prepared framework documents to standardize policies on agricultural biotechnology and biosafety in its member countries. CATIE is involved in the implementation process. Following an Inter-sectorial Meeting of the Ministers of Agriculture, Environment and Health of Central America, a request was made to CATIE and IICA to develop a framework for an inventory on biodiversity in Central America. CATIE is also taking a proactive role with IPGRI and IICA in the reactivation of the regional PGR network REMERFI (Red Mesoamericana de Recursos Fitogenéticos), serving as *Pro Tempore* Secretariat of this network.

- **CATIE/USDA-ARS Workshop on conservation and evaluation of plant genetic resources**
  The workshop was held at the beginning of February 2005 at CATIE. The goals of the meeting were to identify: priority crops of both CATIE and ARS for conservation and evaluation; specific steps to be taken for the conservation and evaluation of these resources in the short, medium, and long term; potential research opportunities, and barriers to the specific tasks identified for collaboration. A major result of the workshop was the introduction of ARS researchers to their counterparts at CATIE and the foundation of a network of scientists from both agencies to develop collaborative research projects in conservation, evaluation, and utilization of plant genetic resources. The lack of a functional, easily accessible and updated PGR database at CATIE has been identified as major obstacle to the enhancement of the exchange and use of germplasm and relevant information at a regional and international level. The information generated from this cooperation will be fundamental to improve the management of gene bank collections, determine strategies for new collections, provide information for genetic improvement and conservation programs, and facilitate the use of genetic resources to address common pest and disease problems of concern to farmers of the entire region of the Americas.

  International support is needed to improve the management of CATIE's germplasm collections, in accordance with internationally accepted Genebank Standards, and to install a functional PGR database and update the related information in order to enhance the exchange and use of germplasm and relevant information at a regional and international level.

D. THE INTERNATIONAL CENTRE FOR UNDERUTILISED CROPS (ICUC)

23. The International Centre for Underutilised Crops (ICUC) was established in 1992 as an autonomous, non-profit, scientific research and training centre. The goal of the centre is food and nutrition security and economic welfare of human beings improved through sustainable and increased economic production for food and industrial raw materials, by assessing, developing and utilising untapped biological diversity of underutilised crops and species.

24. The purpose of the ICUC is to domesticate and incorporate into farming systems those wild plant species and crops which are under-developed and grown by many farmers throughout the world. ICUC's activities are undertaken in order to produce outputs which will contribute to the above purpose and goal. The principle activities are research and development projects and programmes, the assembly and dissemination of information and the development of its partners' human resources necessary for fostering their participation in programme and their uptake of the outputs.

25. The policy of the ICUC is to work with partners within regional and global networks. All activities are based on priority setting, where the priorities are identified in consultations with partners and their clients-the intended beneficiaries, using participatory "bottom-up" methodologies. The ICUC's policy is to work within commodity groups: Cereal and Pseudo-cereals, Fruit and Nuts, Vegetables and Legumes, Roots, Tubers and Industrial and Medicinal crops. Furthermore, ICUC's policy is to be a small, efficient, co-ordinating and facilitating Centre which uses available resources to implement the agreed activities by stakeholders.

26. ICUC activities: ICUC has continued its work during the year. Work is classified under the headings: Research for development and education, Knowledge based information dissemination, and Human resource development and capacity building.

27. **Research for development**: ICUC has been undertaking research and development projects both within the framework of the existing networks, and beyond. ICUC is undertaking the study on assessment of diversity through farmers' participatory survey, development of appropriate propagation methods, and multiplication of materials for distribution to farmers to establish their own nursery with quality materials to increase income from the important tree species.

28. **Activities in Asia**: ICUC along with its partners has established a network of nine countries of the region, on Underutilised Tropical Fruits in Asia (UTFANET) in 1995 because of the interest shown by the National Agricultural Research Systems (NARS). The network identified the national priority species and became active in assessing the genetic diversity through farmers' participatory survey to improve products and marketing of the underutilised fruits. These nine countries, Bangladesh, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Vietnam have identified 10 species: jackfruit, pummelo, mangosteen, ber, amla, tamarind, passionfruit, bael, lapsi and *Annona* spp. These countries have collected superior clones and have established them at nurseries for further characterisation and evaluation and multiplication for distribution of quality planting materials to farmers. So far, 12,000 planting materials have been distributed to farmers. Research has been carried out for development of products which will encourage small producers to become entrepreneurs for their livelihood improvement. Ten products, such as jam, pickles, juice, leather, candy etc have been now produced by local women's groups and entrepreneurs in some countries have been marketing them. ICUC has provided training for products and their marketing to these groups. A project on "assessing the potential adoption of tropical fruit trees in new ecosystems" has been completed with 2 species, tamarind and jackfruit. This will enable us to identify lines for a changing environment.

29. ICUC has been instrumental to establish a network, UTVAPNET (Underutilised Traditional Vegetables in Asia and Pacific Network) to promote traditional indigenous vegetable crops in Asia. The network has identified the priority species and one of the member countries, Philippines has taken the lead to develop a project according to the needs of the countries.

30. **Activities in Africa**: A regional Network for South and East Africa, SEANUC (Southern and Eastern Africa Network on Underutilised Crops) was established in 1996 with the cooperation of FAO and the Commonwealth Secretariat following a regional meeting. Priority species for this network have been identified and a project started on information gathering on the status of indigenous underutilised crops in 12 participating countries. A project on indigenous vegetables of Southern Africa started in 1996. Indigenous vegetables are important for subsistence farmers as they acquire nutrition from these vegetables. ICUC in collaboration with partners in Africa carried out a project on the collection and assessment of genetic diversity of *Amaranth* spp. *Cleome gynandra* and *Tylosoma esculentum* for their use in crop improvement. Selection for improved lines has been made through characterisation and farmers evaluation. These improved materials are now to be multiplied for distribution to farmers.

31. ICUC uses the comparative advantages of national institutions in developing countries. A good example of field work is on the diversity and domestication and selection of improved sheanut in Ghana and Southampton for the Sudano-Sahelian region of West Africa. The research involved a farmer participatory survey in which the farmers (who actually do not farm the trees but collect the nuts from wild trees, which are valued and preserved in the environment) assessed the genetic diversity and identified "best" trees for conservation.

32. A project on improvement of livelihoods through the development of business skills and marketing of forest produce has been successfully completed in Tanzania and Guyana. The project partners have now begun to export identified products made from underutilised crops to UK market. Another project in processing and marketing of indigenous fruits has started in two countries

(Tanzania and Malawi) in Africa. The project includes training on the processing and small entrepreneurship development for non literate farmers.

33. **Activities in Europe**: A European Network on sustainable multifunctional utilisation of underutilised crops (ENUC) has been established in 2002 because of shift in its land use which has stimulated new interest in the potential role of alternative crops including underutilised crops and commodities (UCCs). Several underutilised crops and commodities can make significant contribution to non-food uses, such as pharmaceutical and functional food uses that appeal to the markets in Europe (i.e. renewable energy, fibre, industrial products, oilseeds, herbs and spices). ENUC considered the whole technology chain, from producer to market and brought together specialists from target institutions and is acting as a virtual centre of excellence for stronger integration. The network enables partners in Europe to integrate their activities for collaborative research and implementation of research programmes jointly for the development and utilisation of UCCs. ICUC is a partner of two such projects: CROPGEN and PAVUC which are funded by EU. ICUC is the executing agency for all networks described above.

34. **Knowledge based information dissemination: A global programme**: The ICUC has a large volume of information on new and underutilised crops. Much of this information is unique and original. ICUC has established a data base to house and organise this valuable resource. The database lists information on species basis. It contains essential botanical and agricultural data. The ICUC database also provides information on the use been made of each species, much of it derived from ethno-botanical literature and other sources. The database contains ecological information of the edaphic, climatic and agronomic requirements of each species and the cropping and farming systems to which species are known to be best suited. It contains facts about institutions, scientists and projects dealing with each species and bibliographic information drawn from other databases, together with contact telephone, fax ad e-mail numbers. The ICUC database is under continuous updating and improvement and can be accessed *www.civil.soton.ac.uk/icuc*.

35. "Fruits for the Future" is a project of ICUC dedicated only to the indigenous tropical fruits. The project includes monograph publications with accompanying extension materials for extension assistants and farmers. ICUC has also produced fact sheets, posters on processing methods for fruit products and training manuals for processing and small business development.

36. ICUC has published a number of books in its series of underutilised crops and these include Pulses and vegetables, Cereals and pseudo cereals, Genetic resources of underutilised crops etc. ICUC has published the proceedings of its major conferences and these include new crops for food and industry, new crops for temperate regions, Domestication of New Crops, Fruits for the Future in Asia and other regional conference proceedings. ICUC Global Newsletter on New Crops has been published at irregular intervals and distributed to over 1000 associates on our mailing list.

37. **Human resource development and capacity building:** ICUC runs courses with its network partners in Asia and Africa from time to time. So far it has run 12 short training courses in addition to short courses (3-month) run at the University of Southampton. At Southampton, M.Sc and Ph.D level training have also been given to scientists of partner institutions through ICUC projects.

Collection, characterisation, evaluation and selection of promising lines by ICUC

	Jackfruit		Pummelo		Mangosteen	
	Collection characterization evaluation	*Selection*	*Collection characterization evaluation*	*Selection*	*Collection characterization evaluation*	*Selection*
Bangladesh	70	10	93	5	-	-
India	281	54	40	13	2	1
Indonesia	28	4	-	-	-	-
Nepal	350	47	132	4	-	-
Pakistan	10	5	6	4	-	-
Philippines	148	1	41	1	41	-
Sri Lanka	77	3	66	6	572	2
Thailand	81	2	36	-	52	2
Vietnam	202	8	50	9	50	41

Distribution of planting materials

	Jackfruit	Pummelo	Mangosteen
Bangladesh	525	150	-
India	315	133	-
Indonesia	750	-	-
Nepal	480	500	-
Pakistan	25	-	-
Philippines	16,000	221	40
Sri Lanka	230	460	4353
Thailand	1000	1000	100
Vietnam	500	500	100

No. of farmers received planting materials in each country

	Jackfruit	Pummelo	Mangosteen
Bangladesh	130	140	-
India	59	133	55
Indonesia	20	-	-
Nepal	48	50	-
Pakistan	100	100	-
Philippines	280		50
Sri Lanka	11	15	15
Thailand	117	51	20
Vietnam	300	20	9

Number of beneficiaries trained

Country	Numbers
Bangladesh	98
India	93
Indonesia	20
Nepal	17
Pakistan	25
Philippines	157
Sri Lanka	355
Thailand	80
Vietnam	20
Total	865

E. UNESCO - MAN AND THE BIOSPHERE (MAB)

38. Under UNESCO's Man and the Biosphere (MAB) Programme, 'biosphere reserves' are designated as portions of the landscape that are locally or regionally ecologically representative and that have been recognised for providing scientists and managers with the opportunity to enhance our understanding of the interactions of people with these ecosystems. This understanding is essential in order to be able to manage the ecological and human components of these systems in ways so as to improve their ecological performance while maintaining biodiversity integrity and also guaranteeing the provision of useful products and services.

39. Achieving a sustainable balance between the often-conflicting goals of conserving biodiversity, promoting development and maintaining associated cultural values of local people is an enormous challenge for resource managers. MAB biosphere reserves act at the same time as a model for sustainable and equitable management of biodiversity and of natural resources as well as 'living laboratories' where to test new approaches to the conservation and sustainable and equitable use of nature.

40. In this context, the International Plant Genetic Ressources Institute (IPGRI) and UNESCO's Ecological and Earth Sciences Division have entered into a collaboration in the area of agricultural biodiversity. Action have been undertaken to build on an initial joint UNESCO/MAB-IPGRI international expert consultation, such as convening national and regional meetings to bring together managers and national committees of selected MAB biosphere reserves with plant genetic resources scientists concerned with the conservation and sustainable use of agricultural biodiversity. Normally the two groups are in different ministries and sectors, but through the above-mentioned consultations and meetings, a common agenda involving both constituencies has been forged.

41. The long-term conservation of agricultural biodiversity is effective only when it is conducted in conjunction with work related to the Millennium Development Goals. Linking agricultural biodiversity management with the long-term conservation and sustainable development objectives of the MAB Programme is a concrete strategy to achieve the integration of conservation and development goals across wild and managed landscapes.

42. Currently, a pilot project is being implemented in selected sites: Sierra del Rosario and Cuchillo del Toa Biosphere Reserves (Cuba); Beni Biosphere Reserve (Bolivia); Arganaraie Biosphere Reserve (Morocco); "W" Biosphere Reserve (Benin-Burkina-Faso-Niger); Bolama Bijagos Biosphere Reserve (Guinea-Bissau); and Mae Sa-Kog Ma Biosphere Reserve (Thailand). Sites were selected to cover a wide range of ecological , socioeconomic and cultural conditions that are representative of a specific type of agricultural diversity. This is an open-ended network of collaborative sites, and more sites are likely to be contributing to this project.

43. All of the MAB biosphere reserves involved in the project contain globally significant agricultural biodiversity and are under different threats stemming primarily from unsustainable land-use practices exacerbated by increasing human settlements and/or conflicts between farmers and migrants. Social, economic and cultural drivers of the uses of plant genetic resources for food and agriculture are given a special attention, in such uses may vary considerably within communities on the basis of ethnic group, social status, gender relations, age of the farmer, etc.

44. MAB biosphere reserves provide a network for parties to the Convention on Biological Diversity and the International Treaty on Plant Genetic Resources to monitor the state of biodiversity including agricultural biodiversity at the genetic, species and ecosystem levels. The results of the information collected and lessons learned is instrumental in elaborating more focused policies and implement efforts based on the proper utilization of plant genetic resources for food security, health and income opportunities from direct environmental services but also from indirect ones such as ecotourism – in the context of biodiversity conservation programmes.

F. PLANT RESOURCES OF SOUTH-EAST ASIA (PROSEA) PLANT RESOURCES OF TROPICAL AFRICA (PROTA) PLANT RESOURCES OF LATIN AMERICA AND THE CARIBBEAN (PROLAC)

45. It is estimated that out of a total worldwide pool of 300,000 higher plants, about 40,000 have been put to use by man in the course of history. About 25,000 of these plants occur in the tropics. Information on these 25,000 useful plants is stored in an overwhelming mass of millions of publications in journals, books, magazines, manuals, proceedings, theses, brochures, etc. For the individual user the information has become inaccessible, especially in developing countries due to a lack of easy library and internet access. To avoid loss of knowledge and constant duplication of R&D activities, a major 'information brokerage and knowledge repatriation' programme is needed for the tropics bringing the 'world literature' in condensed form into the public domain.

46. PROSEA (since 1987) has effectively done this for the 7,000 useful plants of the South-East Asian region. PROTA (since 2000) is dealing with the 7,000 useful plants of Tropical Africa. PROLAC (not yet initiated) should deal with the estimated 11,000 useful plants of Tropical America.

47. The reviews are multidisciplinary, combining data on utilization, properties, vernacular names, botany, geography, production and trade, ecology, growth and development, management, diseases and pests, post-harvest handling, genetic resources and breeding, conservation, and prospects. A standardized overview of the 25,000 useful plants of the tropics (there is only an overlap of about 10% between the 3 regions) is no utopia anymore, but within reach. The methodologies and formats are well established. The international donor community has gone a long way in facilitating the realization of these programmes so far, but its continued support is crucial for their completion.

48. The main contribution of these programmes to the 'Utilization of PGRFA' is in providing a comprehensive overview of what 'useful plant biodiversity' exists, where it occurs, and what we know about these plants. Such a complete overview is indispensable for sustainable agriculture and forestry, diversification, food security strategies and environmental conservation programmes. The programmes play an active role in capacity building. More and less experienced PGR workers from the target areas are actively involved as authors/editors of the reviews, and the project nodes in the target areas develop into national and regional focal points for Plant Resources information.

49. **PROSEA** is a core partnership of 7 institutions: Indonesian Institute of Sciences (LIPI), Indonesia; Forest Research Institute of Malaysia (FRIM), Malaysia; Thailand Institute of Scientific and Technological Research (TISTR), Thailand; Institute of Ecology and Biological Resources (IEBR), Vietnam; Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Philippines; University of Technology (UNITECH), Papua New Guinea; and Wageningen University (WU), Netherlands.

50. During the period 1987–2003, the compilation work has resulted in state-of-the-art review articles on the 7,000 useful plants, subdivided into 19 commodity groups. These were published in a 24-volume book series (see: www.prosea.nl), to which more than 1200 PGR specialists have contributed: PROSEA 1:Pulses (1989); PROSEA 2: Edible fruits and nuts (1991); PROSEA 3: Dye and tannin-producing plants (1991); PROSEA 4: Forages (1992); PROSEA 5(1): Timber trees: Major commercial timbers (1993); PROSEA 5(2): Timber trees: Minor commercial timbers (1995); PROSEA 5(3): Timber trees: Lesser-known timbers (1998); PROSEA 6: Rattans (1993); PROSEA 7: Bamboos (1995); PROSEA 8: Vegetables (1993); PROSEA 9: Plants yielding non-seed carbohydrates (1996); PROSEA 10: Cereals (1996); PROSEA 11: Auxiliary plants (1997); PROSEA 12(1): Medicinal plants: part 1 (1999); PROSEA 12(2): Medicinal plants: part 2 (2001); PROSEA 12(3): Medicinal plants: part 3 (2003); PROSEA 13: Spices (1999); PROSEA 14: Vegetable oils and fats (2001); PROSEA 15(1): Cryptogams: Algae (2001); PROSEA 15(2): Cryptogams: Ferns and fern allies (2003); PROSEA 16: Stimulants (2000); PROSEA 17: Fibre plants (2003); PROSEA 18: Plants producing exudates (2000); and PROSEA 19: Essential-oil plants (1999). Recently, the information also became available in a freely accessible Webdatabase (www.proseanet.org).

51. Since the completion of the Core output, the main activity of the PROSEA network in South-East Asia is to cooperate with local organizations in translating the 'knowledge synthesis' into practical applications for education, extension and (small) industries with the ultimate objective of poverty alleviation of end-users.

52. **PROTA** is a core partnership of 11 institutions, 7 in Africa, 3 in Europe, and 1 in South-East Asia: World Agroforestry Centre (ICRAF), Kenya; Makerere University (MU), Uganda; National Herbarium and Botanical Gardens of Malawi (NHBGM), Malawi; Parc Botanique et Zoölogique de Tsimbazaza (PBZT), Madagascar; Centre National de la Recherche Scientifique et Technologique (CENAREST), Gabon; Forestry Research Institute of Ghana (FORIG), Ghana; Centre National de Semences Forestières (CNSF), Burkina Faso; Wageningen University (WU), Netherlands; Agropolis International (AGROPOLIS), France; Royal Botanic Gardens of Kew (RBGKEW), United Kingdom; and Prosea Foundation (PROSEA), Indonesia. The organization is still expanding through contact persons in individual African countries.

53. During the period 2003–2013, the compilation work will result in 7,000 state-of-the-art review articles on the useful plants, contributed by an estimated 1000 PGR specialists. These are published in a freely accessible bilingual Webdatabase (www.prota.org), a bilingual CD-Rom series, and in a 20-volume book series in English and French: PROTA 1: Cereals and pulses/Céréales et légumes secs (prep.); PROTA 2: Vegetables/Légumes (2004); PROTA 3: Dyes and tannins/Colorants et tanins (2005); PROTA 4: Ornamentals/Plantes ornementales; PROTA 5: Forages/Plantes fourragères; PROTA 6: Fruits/Fruits; PROTA 7(1): Timbers 1/Bois d'œuvre 1 (prep.); PROTA 7(2): Timbers 2/Bois d'œuvre 2; PROTA 8: Carbohydrates/Sucres et amidons; PROTA 9: Auxiliary plants /Plantes auxiliaries; PROTA 10: Fuel plants/Bois de feu; PROTA 11(1): Medicinal plants 1/lantes médicinales 1 (prep.); PROTA 11(2): Medicinal plants 2/Plantes médicinales 2; PROTA 11(3): Medicinal plants 3/Plantes médicinales 3; PROTA 11(4): Medicinal plants 4/Plantes médicinales 4; PROTA 12: Spices and condiments/Epices et condiments; PROTA 13: Essential oils and exudates/ Huiles essentielles et exsudats; PROTA 14: Vegetable oils/Oléagineux (prep.); PROTA 15: Stimulants/Plantes stimulantes; and PROTA 16: Fibres/Plantes à fibres.

54. When a commodity group is completed, PROTA initiates an international consultation in order to arrive at conclusions and recommendations for follow-up activities for various target groups. Following the completion of PROTA 2: 'Vegetables' (September 2004), describing 356 African vegetables in 275 review articles, an international consultation by correspondence and a brainstorm workshop led to a Special product in 10 Modules called 'Vegetables of Tropical Africa: Conclusions and recommendations based on PROTA 2: 'Vegetables': Module 1: Contents and justification; Module 2: Vegetables: a general overview; Module 3: Candidate technologies (rural development/vocational training); Module 4: Development gaps (private sector); Module 5: Research gaps (research system); Module 6: Thesis subjects (higher education); Module 7: Conservation needs (research system/government); Module 8: Policy measures (government); Module 9: Comparative data on 275 vegetables; Module 10: Matrix ' 275 species × 6 key issues.'

55. **PROLAC** (not yet initiated). PROLAC would be an initiative similar to PROSEA and PROTA, but for Latin America and the Caribbean. Although no 'Basic list of species and commodity grouping' is available yet, the number of useful plants is expected to be higher than in the other regions because of the greater overall biodiversity. PROLAC would need a 15-year period for completion and substantial financial means from the international donor community.

56. The elements of the trilogy PROSEA / PROTA / PROLAC are programmed consecutively due to the limited financial resources, and thus the standardized knowledge synthesis on the 25,000 useful plants of the tropics will take another 30–35 years for completion (2005–2035). Such a long duration seems hardly acceptable with the actual worldwide attention for 'biodiversity conservation and utilization'. One would expect sufficient financial means to be available to intensify the synthesis and to run parallel programmes in the various continents.

G. FORUM FOR AGRICULTURAL RESEARCH IN AFRICA (FARA)

57. The Forum for Agricultural Research in Africa (FARA) as an apex body responsible for the coordination and facilitation of agricultural research for development in Africa, does not directly engage in *hands-on* research and development. We however, work in close partnership with our founding sub-regional organization (SRO) membership and their NARS constituents, as well as other stakeholders who are the frontline R&D institutions directly involved in the utilization and conservation of plant genetic resources. FARA however contributes to the utilization and conservation of plant genetic resources through support to its diverse stakeholder groups and FARA programmes such as BASIC – Building African Scientific and Institutional Capacities, SSA CP – Sub-Saharan Challenge Programme and DONATA – Rapid dissemination and adoption of proven agriculture-based technologies, are major mechanisms that will enhance the utilization and conservation of genetic resources in Africa.

H. SOUTHEAST ASIA REGIONAL INSTITUTES FOR COMMUNITY EMPOWERMENT (SEARICE)

58. Agricult/AGP/AGPS/Pgr/ITWG3rd/pdf/p3w7f.pdfInformation on projects, programmes and activities addressing on-farm management and improvement of plant genetic resources for food and agriculture in which SEARICE participates in, is provided in Annex 2 of the current document.

ANNEX 1

CAPACITY-BUILDING ACTIVITIES OF THE FUTURE HARVEST CENTRES THAT SUPPORT THE UTILIZATION OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Table 1: Summary Information on Group Training provided by five CG Centres during the Period 2001-2005 (based on data available from CIMMYT, CIP, IITA, ILRI, IPGRI[1])

Priority GPA activity on Utilization of PGRFA	Total no. of courses and percentage of total	Topic Area[2]	No. of courses relating to topic area	No. of courses by type of trainee		Number of trainees by region[3, 4]					Total no. participants
				NARS	Farmers/ local communities, NGOs, extension specialists, etc.	Americas	Asia, Pacific and Oceania	Central and West Asia and North Africa	Sub-Saharan Africa	Global	
9. Expanding the characterization, evaluation & number of core collections to facilitate use	22 (17%)	Characterization /evaluation and core collection development	22	16	6	197	73	3	28	33	334
10. Increasing genetic enhancement & base-broadening efforts	19 (15%)	Genetic enhancement	18	18	1	50	15	15	74	127	281
		Base broadening	17								
11. Promoting sustainable agriculture through diversification of crop production & broader diversity in crops	55 (42%)	Integrated pest management strategies	11	29	26	1407	304	143	255	133	2242
		Strategic use of a range of varieties	32								
		Decentralized and participatory plant breeding strategies	8								
		Biotechnological techniques to facilitate base broadening	3								
12. Promoting the development & commercialization of under-utilized crops & species	7 (.05%)	Identifying under-utilized species with potential for increased sustainable use	1	1	6	195	--	--	62	40	297
		Sustainable management practices for under-utilized species	3								
		Post-harvest processing	2								

[1] Includes information from the Global Facilitation for Underutilized species.
[2] Topic areas are those cited in the section on capacity-building within the respective chapters concerning priority activities (9-14) on the Utilization of PGRFA.
[3] Region of trainee.
[4] Uneven spread across regions is due in part to the limited number of Centres for which full data was available.

Priority GPA activity on Utilization of PGRFA	Total no. of courses and percentage of total	Topic Area[2]	No. of courses relating to topic area	No. of courses by type of trainee		Number of trainees by region[3, 4]					Total no. participants
				NARS	Farmers/ local communities, NGOs, extension specialists, etc.	Americas	Asia, Pacific and Oceania	Central and West Asia and North Africa	Sub-Saharan Africa	Global	
		methods									
		Marketing methods	1								
13. Supporting seed production & distribution	17 (13%)	Improving the range and quality of planting materials made available by seed enterprises	12	8	9	260	296	13	151	--	720
		Improving the physical and genetic quality of farmer-saved seed	5								
14. Developing new markets for local varieties & "diversity-rich" products	10 (.08%)	Raising awareness of the value and potential use of local varieties/under-utilized species	5	1	9	190	32	45	--	125	392
		Development of niche markets for local varieties and diversity-rich products	1								
		Identification and monitoring of factors, activities and processes having potential adverse impacts on conservation and sustainable use of local varieties and diversity-rich products.	6								
TOTAL	130			73	49	2299	720	219	570	458	4266

Table 2: Individual Training at Five CG Centres during the Period 2001-2005 (based on data available from CIP, ICRISAT, IITA, ILRI, IPGRI)

Priority GPA activity on Utilization of PGRFA	Total no. trainees	No. of trainees by type of training		Number of trainees by region[5, 6]					Average percentage women
		Thesis Research	Other individual Training (field or lab research, on-site training, etc)	Americas	Asia, Pacific and Oceania	Central and West Asia and North Africa	Europe	Sub-Saharan Africa	
9. Expanding the characterization, evaluation & number of core collections to facilitate use	165	95	70	48	66	13	5	33	33%
10. Increasing genetic enhancement & base-broadening efforts	37	24	13	--	28	--	1	8	41%
11. Promoting sustainable agriculture through diversification of crop production & broader diversity in crops	116	29	87	13	50	12	4	37	22%
12. Promoting the development & commercialization of under-utilized crops & species	92	60	32	48	7	5	7	25	45%

[5] Region of trainees.
[6] Uneven spread across regions is due in part to the limited number of Centres for which full data was available.

Priority GPA activity on Utilization of PGRFA	Total no. trainees	No. of trainees by type of training		Number of trainees by region[5, 6]					Average percentage women
		Thesis Research	Other individual Training (field or lab research, on-site training, etc)	Americas	Asia, Pacific and Oceania	Central and West Asia and North Africa	Europe	Sub-Saharan Africa	
13. Supporting seed production & distribution	17	5	12	5	2	6	--	4	12%
14. Developing new markets for local varieties & "diversity-rich" products	24	17	7	5	3	1	3	12	50%
TOTAL	451	230	221	119	156	37	20	119	

ANNEX 2
SEARICE PROGRAMMES, PROJECTS AND ACTIVITIES

1. Project/programme/activity addressing on-farm management and improvement of plant genetic resources in food and agriculture (PGRFA) in which the organization participates, listing local farmer communities and number of farmers involved.					
Stakeholder	**Name of on-farm conservation programme/project**	**Local farmer community involved**	**Number of farmers involved**	**Activities include:**	**Other project activities**
SEARICE	Farmer Field School	Poblacion Vieja	550 farmers (126	Pilot sites established in high-risk areas such as	Organic Agriculture farming and organic rice marketing

(Bohol, Philippines)	(FFS) on Plant Genetic Resources Conservation Development and Use Participatory Varietal Selection and Participatory Plant Breeding for rice and rootcrops	Sustainable Farmers Association; Kapunungan sa Mag-uuma Alang sa Katilingbanong Kalambuan; Cansumbol Organic Farmers Association;Campagao Farmers' Production Research Association; Malitbog Sustainable Farmers' Association ;Zamora Organic Farmer Researcher Association; Katipunan Farmers In New-expansion areas: involving 10 villages/farming communities in 14 municipalities	direct farmer-partners)	drought areas, rainfed, alkaline and acidic; assessment of farmers' knowledge; characterization and evaluation of local varieties; studies on local varieties population structure and dynamics; on-farm breeding; seed multiplication and distribution of bred varieties; assessment of local varieties utilization and management; socio-economic assessment of PGRFA on-farm management and improvement; and, environmental assessment of PGRFA on-farm management and improvement Farmers' Field Days PGRFA Policy related discussions and dialogue	Farmers' Field Day-seed distribution of varieties requested; evaluation of the trial and the process done; and, planning Seed Calamity/Disaster Preparedness Program in two municipalities Provincial Seed Procurement Program for Upland Areas Provincial Training on Farmers Field Schools for PGRFA for Department of Agriculture extension agents Policy lobby and advocacy on PGRFA related issues (new technologies, intellectual property rights, access and benefit sharing)
SEARICE (Arakan Valley Complex, North Cotabato, Philippines)	Farmer Field School (FFS) on Plant Genetic Resources Conservation Development and Use Participatory Varietal Selection and Participatory Plant Breeding for rice and corn Conservation and utilization of traditional herbal medicines	3 provinces, 7 municipalities, 27 communities North Cotabato-Malatab Organic and Research Farmers' Association; Mabuhay Organic Farmers Association; Luhong Organic Production Association; Kamarahan Peoples' Organization; Ilustre Sectoral Association; Alegria Diversified Farmers Association; Upper Paatan and Katidtuan Sustainable farmers Association; Cebuano, Antiqueno, Manabo Farmers Health Association in Del Carmen; Poblacion, Labuo, Binay, Inac, Doles, Idaoman, Bukidnon-Sto. Niño, Nabag-o, Managok, Simaya, San Martin, Sinanglanan, Apo Macote, Lambayong, Sultan Kudarat- Lilit, Tumiao, Mamali, Matiompong,	450 direct farmer partners	Pilot sites established in high risk areas (in areas near conflict), rainfed and irrigated (both upland and lowland); assessment of farmers' knowledge; characterization and evaluation of local varieties; studies on local varieties population structure and dynamics; on-farm breeding; seed multiplication and distribution of bred varieties; assessment of local varieties utilization and management; assessment of improved varieties utilization and management; socio-economic assessment of PGRFA on-farm management and improvement	Organic Farming, Diversified farming, Organic rice marketing Farmer Field Day- evaluation of trial and processes, assessment of experiences and planning Community Health Care Vegetable Communal Gardening (Seeds Production) Product development from PGRFA (soaps, herbal medicines etc) Marketing of organic products

		Midtapok 1 new expansion area namely Paglat, Maguindanao province			
SEARICE (Bohol and North Cotabato)	Conservation of landraces (rice, corn, rootcrops) through farmer curators	Indigenous Communities in Arakan Valley, interested individual farmers in Bohol and North Cotabato	69 household	Assessment of farmers' knowledge; characterization and evaluation of local varieties; studies on local varieties population structure and dynamics; on-farm breeding; seed multiplication and distribution of bred varieties; assessment of local varieties utilization and management; Assessment of improved varieties utilization and management	
Mekong Delta Farming Systems Research Institute (MDFSRI), Can Tho University, Can Tho Vietnam And SEARICE	Community Biodiversity Development and Conservation (CBDC) Program – Vietnam	Farmers from the Vietnam Farmers Union, Local Seed Clubs in the 12 Provinces of the Mekong Delta namely, Long An, Dong Thap, Ben Tre, Vinh Long, Tra Vinh, Soc Trang, Bac Lieu, Ca Mau, Can Tho, Kien Giang, An Giang, Tien Giang	7,215 farmers from 171 communities in 12 provinces	Capacity building of farmers & local institutions on PGRFA conservation, development and use through training, exposure, study visits, and on-farm trials; rehabilitation of traditional varieties, participatory plant breeding and selection, on-farm varietal evaluation, seed multiplication & distribution; building community seed networks;	Marketing of farmer seeds campaigns for policy support through Farmers' Technical Conferences, seed fairs, information and education campaign materials development & distribution through mass media, research & documentation; establishing linkages between farmers, extension units & research institutions
Plant Protection Department (PPD), Ministry of Agriculture and Rural Development, Vietnam And Oxfam Solidarity Belgium in Vietnam And SEARICE	Biodiversity Use and Conservation in Asia Program (BUCAP) – Vietnam	Farmers from the Integrated Pest Management Clubs, Farmers Union and local seed clubs in 11 provinces namely, Bac Kan, Yen Bai, Ha Noi, Hoa Binh, Nghe An, Quang Binh, Thua Thien Hue, Quang Nam, Dong Thap and Kien Giang	3,235 farmers from 91 villages in 11 provinces covering 3 regions	Development of FFS curriculum specific on rice PGR CDU; capacity building of farmers & local institutions on PGRFA conservation, development and use through training, exposure, study visits, and on-farm trials; rehabilitation of traditional varieties, participatory plant breeding (PPB) and participatory varietal selection (PVS), on-farm varietal evaluation, seed multiplication & distribution;	Securing the local seed supply Trials on systems of rice intensification Studies on integrated pest management Supporting group formation local campaigns for policy support through Farmers' Technical Conferences, seed fairs, field days, & mass media; community self-assessment of project
Hak Muang Nan Network, Nan Thailand And SEARICE	CBDC – Thailand	Farmers in Nan, Thailand with some farmers from Phrae and Central Thailand taking interest	Intense in 1 province and 6 villages, 2 monk schools, 13 farmer-groups/network, 192 farmers (71 women) With work in other provinces through networks	Participatory Varietal Selection (PVS)/ participatory plant breeding (PPB), workshops/orientations, farmers technical trainings/conferences, networking, capacity-building on PGRFA conservation, training of trainors, farmer field days, securing seed supply system (SSS) through seed production, seed quality monitoring, establishing seed exchange and organizing farmers' seed banks at communities, marketing system for seed distribution,	Conservation of PGRFA with children Curriculum development (incorporating conservation and development of PGRFA) in monk schools Sustainable Agriculture - training on composer, training on indigenous micro-organism, cross visit and study tour Publication of technical manuals Campaigns

					Organizing alternative market, Adaptation of farmer field school curriculum Identification of women related problems and needs towards PVS/PPB and PGRFA conservation
Department of Agriculture, Ministry of Agriculture and Forestry, Lao PDR With National Agriculture Research Centre, National Agriculture and Forestry Institute, Ministry of Agriculture and Foresty, Lao PDR And Oxfam Solidarity Belgium in Lao PDR And SEARICE	BUCAP Lao PDR	Farmers from the provinces of Vientianne, Luang Prabank, Savanakhet and Champassak	391 farmers from 26 villages of 4 provinces	Adaptation of FFS curriculum specific on rice PGR CDU; capacity building of farmers & local institutions on PGRFA conservation, development and use through training, exposure, study visits, and on-farm trials; rehabilitation of traditional varieties, participatory plant breeding and selection, on-farm varietal evaluation, seed multiplication & distribution;	student internship in BUCAP sites, integration of PGR CDU topics in school curriculum; local campaigns for policy support through Farmers' Technical Conferences & seed fairs; adaptation of PPB & PVS in national agriculture research center; community self-assessment of project

National Biodiversity Centre, Ministry of Agriculture, Bhutan with Department of	BUCAP Bhutan	Farmers from 6 Dzongkha namely, Paro, Thimpu, Wangdue Phodrang, Punakha, Mongar, Trashigang	96 farmers from 9 villages in 6 provinces covering 3 regions	Adaptation of FFS curriculum specific on rice & maize PGR CDU; capacity building of farmers & local institutions on PGRFA conservation, development and use through training, exposure, study visits, and on-farm trials; rehabilitation of traditional varieties, participatory varietal selection, on-farm varietal evaluation;	adaptation of FFS as an extension methodology adaptation of participatory varietal selection in research centers; community self-assessment of project influencing national policies to support farmers' rights to seeds, e.g. BUCAP participation in the drafting of implementing rules & regulations of the Seed Act and Biodiversity Act of Bhutan

Agriculture, Ministry of Agriculture, Bhutan with Renewable Natural Resources Research Centres, Ministry of Agriculture, Bhutan And SEARICE					

2. Major limitations to on-farm management and improvement of PGRFA in the country.

Stakeholder		Other (please specify)
SEARICE (Philippines)	On-farm management and improvement of PGRFA not a national priority – insufficient support and incentives to farmers for on-farm management of PGRFA; insufficient funding for local institutions supportive on on-farm PGRFA management; lack of capacities and skills of local institutions on conservation and management of PGRFA; centralized management of PGRFA; inadequate support services (post harvest facilities, irrigation, marketing for diversity, extension services, researches)	New technologies such as entry of GMO crops and hybrid rice, government agricultural policies (crop conversion, massive promotion of new breeds/varieties) affecting on-farm management and improvement of PGRFA; enactment of plant variety protection law Conservation of PGRFA not a public research priority (public research institutions suffer from lack of funding support) nor an extension priority
Vietnam	Inadequate capacities of farming communities to conserve PGRFA in the changing environment; weak capacities of local institutions (e.g. agricultural extension system; research institutions) to support on-farm management of PGRFA; National policies & programs favoring cultivation of few selected modern varieties, e.g. Five Varieties Program of Mekong Delta; lack of government support to on-farm management of PGRFA	New seed technologies restricting farmers' rights to freely save, use, exchange and sell seeds; Free trade agreements with its associated IPR protection such as PVP which conflicts with inherent rights of farmers to their PGR
Thailand	Inadequate farmers' capacities in the context of changing market and agriculture; limited planting and seed production areas (80% of farmers in Nan are tenants); limited competent individual and organisation on the issue; limited interest on the issue from government bodies	Policies which limit access and control of farmers on PGRFA
Lao PDR	Inadequate capacities farming communities under changing market and production system; weak capacities of local institutions (e.g. agricultural extension system) to support on-farm management of PGRFA; limited staff; lack of clear National policies & programs on access and use of PGRFA; lack of government support to on-farm management of PGRFA	Impending accession of Lao PDR to WTO which would require the country to adopt IPR protection such as PVP which conflicts with inherent rights of farmers to their PGRFA Limited access to information and options available to frame policies supportive of farmers' efforts on conservation and development of PGRFA
Bhutan	Weak capacities of local institutions (e.g. agricultural extension system) to support on-farm management of PGRFA; limited staff; limited staff capacities; lack of government support to on-farm management of PGRFA; physical difficulties/limitations in traveling to farming communities	Development of policies which may impinge on Farmers Rights to PGRFA

3. Comments on promoting on-farm management and improvement of PGRFA, including regional and international assistance needed in the country.

Stakeholder (SEARICE)	
Philippines	Financial support for on-farm PGRFA management and improvement needed Governments to prioritize PGRFA management and improvement

	Aside from on-farm work, policies should be made responsive to the efforts and needs by farmers for on-farm PGRFA conservation and management
Vietnam Thailand Lao PDR Bhutan	There are positive responses from governments and civil society groups to support on-farm PGRFA but incentives/support mechanisms for on-farm conservation efforts of farmers still lacking; capacity building for farmers and local institutions on on-farm management of PGRFA should be supported; regional and international exchanges among farmers and other stakeholders (from research and extension agencies) should be fostered to strengthen regional and international PGRF management and conservation work National, regional and international policy trends should be monitored and stakeholders informed of the debates in order to develop sound policies supportive of on-farm PGRFA conservation and management

4. Community genebanks established and strengthened to facilitate reintroduction of germplasm following disasters.

Stakeholder	Name of community genebank
SEARICE (Bohol, Philippines)	Center-based, medium-term cold storage seedbank of the Tripartite Collaboration between the CVSCAFT, CBDC-Bohol and the FCC (Farmers' Consultative Council)(-)
SEARICE (Bohol, Philippines)	*Malitbog Sustainable Farmer's Association (Seed Calamity/Disaster Preparedness Program)*
SEARICE (North Cotabato, Philippines)	Del Carmen Community seed bank
SEARICE (North Cotabato, Philipines)	Ilustre Community Seed bank
SEARICE (North Cotabato, Philippines)	Kabacan Community Seedbank
SEARICE (North Cotabato, Philippines)	CONSERVE Center Based Seed bank
Mekong Delta, Vietnam	CBDC Vietnam Seed Network and Farmer seed banks
Nan, Thailand	Joko Seed Bank

5. Name of the area affected, disaster data and type, reintroduction date, the name of the crop/and or cultivar(s) reintroduced and the source germplasm when germplasm was reintroduced in the country following disaster.

Stakeholder	Name of disaster area	Type of disaster	*Other types of disaster*	Name of crop	Cultivar(s) reintroduced	Date of reintroduction (YYYY/MM)	Source of germplasm	Other sources of germplasm
SEARICE	Brgy. Malitbog, Dagohoy Bohol	Drought		Rice	Farmer developed rice varieties	2002-2003	Farmers	CONSERVE
SEARICE	Brgy. Malatab Antipas North Cotabato	Drought		Rice, Corn, Vegetables and fruit tress	Various	2000	Farmers	Center-based seedbank, University of Southern Mindanao
SEARICE	Bgry. Ilustre Pres. Roxas North Cotabato	Drought		Rice, corn vegetable, fruit trees	Various	2000	Farmers	CONSERVE center-based seedbank, University of Southern Mindanao
SEARICE	Bgry. Del Carmen Pres. Roxas	Drought		Rice, corn, vegetables and fruit trees	Various	2000	Farmers	CONSERVE center-based seedbank, University of Southern Mindanao
SEARICE	Brgy. Labu-o, Pres. Roxas, North Cotabato		Irrigation Destruction	Rice	Farmer developed rice varieties	2004	Farmers	CONSERVE center-based seedbank

7. Greatest constraint to restoration of locally adapted germplasm following disasters in the country

Stakeholder	
SEARICE	Germplasm adapted in the community is unavailable for reintroduction especially with widespread El Niño when seeds are also consumed as food

8. Comment on the reintroduction of locally adapted germplasm and assisting farmers in the restoration of agricultural systems in the country following disaster. And, comment on the regional and international assistance that may be needed to ensure rapid and efficient reintroduction of germplasm in the country following disasters.

Stakeholder	
SEARICE	Distribution of rice seeds during the El niño was not the priority concern of the Provincial Disaster Coordinating Council (PDCC). Assistance made by the PDCC to the calamity-affected areas is in the form of food supply and not agricultural needs/inputs (such as seeds).

	Available seeds for distribution are in small amount incapable of covering the entire affected areas. Disaster preparedness (seed disaster response mechanism) should be set in place for the community as part of on-farm PGRFA management, including networking across communities

9. Programme/project/activity relating to sustaining ex situ collections presently carried out with the participation of the organization, indicating the conservation method(s) used and the number of professionals involved.

Stakeholder	Ex situ conservation programme/project/activity	Type of activity	Other activity type	Number of professionals involved
SEARICE	CVSCAFT (Local Agricultural College) -SEARICE-Farmers' Coordinating Council collaboration on community center-based seedbanking	Center-based medium-term cold storage and short–term storage of seeds/varieties; accessions and collections of seeds/ varieties; on-farm organic rice seed production and seed increase; rejuvenation of seeds, multi-location and adaptability trials.	SA-PGRCDU curriculum development; student internship program, capacity-building for faculties (academe and farmers); conduct of techno-fora, trainings, workshops, conferences, farmer's festivals.	3 staff with 7 staff from the school and 15 farmer partners
SEARICE	Center based seed bank and networks with community seedbanks	Center-based medium-term collection and short term collections storage of seeds/varieties; center-based farm experimentation on PGR conservation and development, regeneration of different varieties, seed increase, mass production of farmer-developed varieties, regular check-up of black box held at the Philippine Rice Research Institute genebank	Centre based experiments on system of rice intensification, strip cropping,	2 staff with 7 farmer partners
MDFSRI. Can Tho Vietnam	Genebank at MDFSRI	Centre based medium term/long term and short term collection of rice, corn, rootcrops in cold storage; field storage of rootcrops; collection, classification, regeneration studies; characterization work; distribution for farmer breeding and institutional breeding work Supports the community based/on-farm PGRFA conservation and development work by securing farmer developed materials in the genebank	Seed fairs; collection Research and documentation Training of agricultural staff and farmers on seed keeping techniques	
NBC, Bhutan	Integrated Livestock & Crop Conservation Project	Nationwide inventory & collection, characterization & conservation of germplasm; establishment of biodiversity information database	Training staff on proper genebank management	
NARC, Lao PDR		Collection, characterization, evaluation, & conservation of germplasm; research on cultivation techniques, cropping pattern & agricultural production systems in different agro-ecological conditions; crop improvement & seed production	Training agriculture officers in different provinces on PGRFA management & improvement; Keeps the farmer selected materials from PPB and PVS work/on-farm PGRFA programs in the genebank as back up collection and for comparison studies	
Nan, Thailand	Joko Seed Bank	Collection, characterization and seed keeping for short term storage under ambient conditions; regeneration and distribution of seeds Improvement of local stocks/varieties	Distribution of seeds and planting materials to farmers Work with children on seed keeping/handling	

10. Each ex situ collection, held by the organization, and for each taxon or crop, sample status, geographic origin, number of accessions stored in the collection, number of accessions safety-duplicated in other genebanks and the name of the genebank(s) holding such duplications.

Stakeholder	Name of ex situ collection	Name of taxon	Name of crop	Status of accession	Geographic origin	Number of accessions	Number of accessions safety-duplicated at other genebanks	Genebank holding safety-duplicate
SEARICE	CVSCAFT Center-based seed bank(-)	Oryza sativa	Rice	Stable varieties and segregating lines	Bohol, Cebu, Leyte, Iloilo, Negros, Luzon, Mindanao, Vietnam, Thailand, Malaysia,	220 stable varieties 16 Segregating lines	-	
SEARICE	Management and Conservation of Rice Germplasm	Oryza sativa	Rice	Traditional cultivar/Landrace Stable	South and Central Mindanao; Bohol and exotic collection from Thailand, Vietnam and Lao PDR	589	609	Philrice(-)

		Zea Mays	Corn		South and Central Mindanao	10		
SEARICE	PhilRICE Genebank	Oryza sativa	Rice Corn	Stable	South and Central Mindanao	609	More than 700	CONSERVE Center-based seedbank
MDFSRI. Vietnam			Rice		Mekong Delta	800 traditional rice varieties + 300 upland rice varieties		
NBC, Bhutan	National Genebank	Ilucine, Brassica, Solanum, Zea, Oryza, etc.	Cereals, vegetables, root crops	Landraces	4 regions of Bhutan	More than 600		IRRI
NARC, Lao PDR	National Genebank		Cereals, legumes, tubers & root crops & industrial crops (sugarcane, cotton)			Cultivated rice – 13,195; wild rice - 237		IRRI
Nan, Thailand	Joko Seedbank	Oryza sativa	Rice, vegetables	Land races	North Thailand	More than 150 rice varieties		
*detailed information can be sourced from the respective institution								

11. Major constraints to implementing ex situ conservation activities

Stakeholder		**Other (please specify)**
SEARICE	Labor intensive necessitates resources (funds and staff)	
MDFSRI. Can Tho Vietnam	Support (financial, training, facilities; staff) to ex situ conservation work	
NBC, Bhutan	Genebank newly established (barely a year old); weak institutional capacity; insufficient number of staff with capacity to manage and maintain the *ex situ* conservation activities; lack of funds to sustain *ex situ* conservation activities (current activities externally funded)	
NARC, Lao PDR	Lack of facilities; lack of funding; limited number of staff	
Nan, Thailand	Labor intensive needs resources to make workable	

12. Priorities, needs and constraints to sustaining existing ex situ collections, opportunities for further action at national or sub-regional level, and actions or support needed from regional and/or international organizations.

Stakeholder	
SEARICE	The government should assist and support farming communities with their local initiatives on community seed bank, in terms of facilities, training, funding etc.
MDFSRI. Can Tho Vietnam	MDFSRI provides a good model for the complementation of *ex situ* with *in situ* work – the lessons and experience should be documented and shared; opportunities for sharing and exchanges be provided to the institution; need for support to improve facilities and research capacities
NBC, Bhutan	Need to establish stronger linkage between *in situ* & *ex situ* conservation activities involving farming communities in decision making & improving access of farmers to *ex situ* collection; need to look into issues of financial sustainability reducing dependence on external funding; institutional capacity building support needed from regional/international organizations
NARC, Lao PDR	Need to improve facilities and generate funds to sustain activities; ; institutional capacity building support needed from regional/international organizations
Nan, Thailand	Local government support to such initiatives

Stakeholder	**Name of programme/ project/activity**	**Name of taxon**	**Name of crop**	**Trait(s)/ characteristic(s) addressed**	**Agroecological zone(s)/ Farming system(s) (the improvement applies to)**	**Estimated importance of the improvement in terms of food security for the specified agroecological zone/farming system**	**Germplasm source(s)**	**Participatory breeding involved farmers in:**	**Output produced**	**Year of output production**
SEARICE	Participatory	Oryza	Rice	Lodging resistant	Alkaline areas	High	Local	Setting breeding priorities; Selecting	27 varieties produced	2000 - 2005

	Plant Breeding	sativa		heavy grain weight red grain color not susceptible to rats long panicles short maturity short height big grains good eating quality resistance to disease aromatic	Acidic areas rainfed areas		genebank, farmers	from fixed lines or finished varieties (participatory varietal selection);Selecting from segregating populations; Making crosses and/or determining parents	and used by different farming communities	
SEARICE	Participatory Plant Breeding and Participatory Varietal selection (-)	Oryza sativa	Rice	Pest resistant lodging resistant good eating quality high yield long grain heavy weight glutinous long panicle; aromatic; red grain color	acidic alkaline drought resistant	High	Local genebank; farmers	Setting breeding priorities;Selecting from fixed lines or finished varieties (participatory varietal selection);Selecting from segregating populations;Making crosses and/or determining parents	70	1997 - 2005
MDFSRI. Can Tho Vietnam	Participatory Plant Breeding (PPB) & PVS	Oryza sativa	rice	High yield, pest resistant, big grains, good tillering, aromatic	suitable to local conditions	High	Local genebank	Setting breeding priorities, selecting from fixed lines or finished varieties; selecting from segregating populations, making crosses and/or determining parents		
Renewable Natural Resources Research Center (RNRRC), Bhutan	Participatory Varietal Selection (PVS)	Oryza sativa	rice	Resistance to rice blast	High altitude	High	Research Center	Setting selection criteria; selecting from segregating populations	6 blast resistant lines selected out of 7 crosses; evaluation still on-going	2003-to-date
		Zea mays	corn	increase height	Adaptability to high altitude	High	Research Center	Setting selection criteria; selecting from segregating populations	On-going	2001-to-date
NARC, Lao PDR	Participatory Plant Breeding (PPB) & PVS	Oryza sativa	rice	High yield, good eating quality, pest resistant, lodging resistant, big grains, good tillering, aromatic	can grow both on dry & wet seasons; suitable to local conditions; acidic soils	High	NARC	Setting breeding priorities, selecting from fixed lines or finished varieties; selecting from segregating populations, making crosses and/or determining parents, conducting observation yield trials	43 successful crosses; 214 selected lines	2000-to-date
Nan, Thailand	Participatory Plant Breeding and PVS	Vegetables (diverse) Oryza Zea mays	Luffa, pumpkins, chili, rice, corn	High yield, good eating quality	Suitable to local conditions	high	Farmers and local university and research centre	Setting breeding priorities, selecting from fixed lines or finished varieties; selecting from segregating populations, making crosses and/or determining parents, conducting observation yield trials	15 farmer developed rice varieties; segregating lines	1998 to date

14. Genetic enhancement (including base-broadening) programme/project/activity in which the organization participates. Specified type of and rationale for each activity, details of the starting materials and methods for assessing diversity in them, indicating whether or not farmers are involved in the activity.

Stakeholder	Name of programme/ project/activity	Name of taxon	Type of activity	Other type of activity	Rationale for activity	Other rationale for activity	Assessment of genetic diversity was made through	Starting materials	Farmers involvement
SEARICE	Participatory Plant Breeding and Participatory Varietal	Oryza sativa	Genetic enhancement by introgression for specific traits; Population improvement through incorporation	On-farm research	Specific trait not available in current breeding materials;	active farmer participation in breeding activity and location	Agro-morphological studies and	Improved varieties currently use; Local varieties/landraces;	Setting the breeding objectives;

	Selection		or base broadening		Evidence of narrow genetic base	specific	isozyme analysis	farmer developed varieties, exotic varieties	crossing, selection form segregating population, adaptability trials, seed increase and multiplication
SEARICE	Participatory Plant Breeding and Participatory Varietal Selection	Oryza (-)	Genetic enhancement by introgression for specific traits; Population improvement through incorporation or base broadening	On-farm Research	Specific trait not available in current breeding materials; Evidence of narrow genetic base	low fertilizer input for rice, farmer empowerment	Agro-morphological studies	Improved varieties currently used; Local varieties/landraces; farmer developed varieties, exotic varieties	Setting the breeding objectives; crossing, selection form segregating population, adaptability trials, seed increase and multiplication
MDFSRI. Can Tho Vietnam	CBDC	Oryza	Base broadening through farmer breeding; crosses with traditional materials and exotic (introduced)	On-farm research and on-station research	Adaptability in changing environment and deliberate base broadening for diversity	Farmer developed materials under farmers' own cropping system	Agro-morphological studies, isozyme analysis	Landraces, Improved varieties; farmer developed varieties, exotic varieties	Setting the breeding objectives; crossing, selection from segregating population, adaptability trials, seed increase and multiplication
Renewable Natural Resources Research Centre, Bhutan	BUCAP	Oryza and Zea	Base broadening through farmer breeding; crosses with traditional materials and exotic (introduced)	On-farm research and on-station research	Adaptability in changing environment and deliberate base broadening for diversity	Farmer developed materials under farmers' own cropping system	Agro-morphological studies	Landraces, improved varieties, farmer developed varieties, exotic varieties	Setting the breeding objectives; selection from segregating population, adaptability trials, seed increase and multiplication
NARC, Lao PDR	BUCAP	Oryza	Base broadening through farmer breeding; crosses with traditional materials and exotic (introduced)	On-farm research and on-station research	Adaptability in changing environment and deliberate base broadening for diversity	Farmer developed materials under farmers' own cropping system	Agro-morphological studies	Land races, improved traditional varieties, improved materials, farmer developed varieties, exotic varieties	Setting the breeding objectives; selection from segregating population, adaptability trials, seed increase and multiplication
Nan, Thailand	CBDC	Oryza	Base broadening through farmer breeding; crosses with traditional materials and exotic (introduced)	On-farm research	Adaptability in changing environment and deliberate base broadening for diversity	Farmer developed materials under farmers' own cropping system (organic system)	Agro-morphological studies	Land races, improved traditional varieties, farmer developed varieties, exotic varieties	Setting the breeding objectives; crossing, selection from segregating population, adaptability trials, seed

									increase and multiplication

15. Comment on priorities, needs and constraints to implementation, opportunities for further action at national or sub-regional level, and actions or support needed from regional and/or international organizations.

Stakeholder	
SEARICE	Need government's support in the breeding activities conducted by farmers such as recognition of farmers as breeders and their varieties developed towards the development of a national seed system; establish protection mechanisms for the use of the developed varieties against monopolization and misappropriation.
MDFSRI. Can Tho Vietnam	Setting of regional and international platform for plant breeders and farmer breeders involved in participatory plant breeding Support to participatory researches and technical studies Capacity building of local research institution to be more responsive to farmers needs
RNRRC , Bhutan	
NARC, Lao PDR	
Nan, Thailand	

16. Programme/project/activity related to assessment or improvement of diversity within and among crops or crop production in which your organization participates, indicating the crop(s) and topics covered and any relevant publication.

Stakeholder	Name of programme/ project/activity	Name of crop	Topics covered
SEARICE Bohol	Diversification Project (CBDC)	Corn, Sweet potato, vegetables	Assessing/monitoring intra-specific diversity in crops; Increasing diversity in agricultural systems
SEARICE Mindanao	Integrated Farming System (CONSERVE)	Rice, corn, vegetables, fruit trees, herbal plants	Increasing intra-specific diversity in crops; Increasing diversity in agricultural systems; Participatory diversity methods applied
MDFSRI. Can Tho and Plant Protection Department, Vietnam	Rice Diversity (CBDC)	Rice, rootcrops	Increasing intra-specific diversity
NBC, Bhutan	Rice and Corn Diversity (BUCAP)	Rice, corn	Increasing intra specific diversity
NARC, Lao PDR	Rice Diversity (BUCAP)	Rice	Increasing intra specific diversity
Nan, Thailand	Integrated, diversified farming (CBDC)	Rice, liffa, pumpkins, chilis	Increasing intra and inter specific diversity

17. Major constraints in the country in diversifying crop production and broadening diversity in crops.

Country	Other (please specify)
Philippines	Security of land tenure; government policies and programs
Vietnam	Market demands
Bhutan	Biophysical conditions
Lao PDR	
Thailand	Government policies and programs

18. Programme/project/activity related to seed production and distribution in which the organization participates, taxa/crops and topics covered, and relevant references.

Stakeholder	Name of programme/ project/activity	Name of crop/crop group	Topics covered
SEARICE	Tripartite Organic seed production	Rice	Seed production; Seed storage; Seed processing; Seed quality control; Seed distribution; Participatory community-based activities; Linkages between formal and informal seed sectors Growing techniques and basic seed information (maturity, expected harvest, other characteristics)
	Farmer to farmer seed distribution	Rice, corn, vegetables	
MDFSRI. Can Tho Vietnam Farmer Groups	CBDC	Rice	Seed production, processing and storage; seed distribution; working through farmer seed networks
NBC, Bhutan			
NARC, Lao PDR Plant Protection Centre Farmer groups	BUCAP	Rice	Seed production, maintenance, storage and distribution to other farmers
Hak Muang Nan Network, Thailand	CBDC	Rice	Seed production, seed storage, distribution and basic recoding/monitoring

19. Major constraints in the country in making seed of new varieties available in the market for each crop/crop group.			
Stakeholder	**Name of crop/crop group**	**Constraint**	**Other constraint**
SEARICE	Rice	Varieties poorly adapted to local conditions; Insufficient availability of disease-free planting material; Poor seed storage facilities; Poor seed germinability; Availability and cost of required production inputs; Seed price too high as compared to commodity price	chemical based, the cost of fertilizer is too expensive; national seed certification especially for farmer-developed varieties lacking
MDFSRI. Can Tho Vietnam		Seed certification standards, policies and programs on seeds	
NBC, Bhutan		Delivery/distribution	
NARC, Lao PDR		Production of good quality seeds, certification and standards	
Hak Muang Nan Network , Thailand			

20. Efforts made towards developing value-added processing of 'diversity-rich' products for commercial purposes.	
Stakeholder	
SEARICE	Development with farmers of rice based products; medicinal herbs preparations; soap making; soy sauce making; oil extraction; organic seed production

21. Incentive that has been examined or implemented to promoting markets for local varieties and 'diversity-rich' products.		
Stakeholder		**Other (specify)**
SEARICE	Organic farming; strengthening cooperation of producers; product processing (link with household based livelihood system)	On going in formulation of organic standard for the province
MDFSRI. Can Tho Vietnam	Recognition of farmers who maintain a large genetic diversity during diversity fairs; exploring different marketing strategies for farmer-developed seeds; organizing seed networks for marketing of farmer-developed seeds	
NBC, Bhutan	Awarding of farmers with unique or extra-ordinary farm products during diversity fairs	Exploring niche market for organic products
NARC, Lao PDR	Developing of niche marketing for sticky rices	
Hak Muang Nan Network, Thailand	Organize markets for organic products	

22. Critical constraints to increasing markets for local varieties and 'diversity-rich' products in the country.		
Stakeholder		**Others (please specify)**
SEARICE	Emphasis on modern cultivars of staple crops; uniformity standards in the country discourage 'diversity rich' products; development/establishment of markets for local varieties is not a national priority; lack of financial support; and, disincentives in the country.	
MDFSRI. Can Tho Vietnam	Government bias to few modern varieties; lack of government support on marketing (even production) of local varieties	
NBC, Bhutan	Bias of key government agencies to modern varieties; marginal agro-ecosystem requiring more support to farmers for them to sustain their production; absence of good marketing strategy for local varieties	
NARC, Lao PDR Plant Protection Centre, Lao PDR	Government desire to modernize agriculture in order to increase agricultural production; absence of government program that promote marketing of local varieties;	
Hak Muang Nan Network, Thailand	Uniformity standards discourage 'diversity-rich' products; entry of new seed technologies threaten diversity	

23. Programme/project/activity carried out by the organization in collaboration with any PGRFA network for PGR enhancement.	
Stakeholder	**Name of programme/project/activity**
SEARICE	CVSCAFT (academe) -SEARICE-FCC (farmer) collaboration for seed banking, storage, distribution and marketing
SEARICE	Bohol Initiators for Sustainable Agriculture and Development – for organic seed production; technical backstopping
SEARICE	Bohol Network for Farmers Rights – towards policy and advocacy on PGRFA
SEARICE	Provincial programme on PGRFA by the province of Bohol with10 participating municipalities, 7 government agencies/collaborators with SEARICE. The work is towards provincial PGR conservation, development and use program with farmer field school (FFS) training of farmers as a major activity. Work is with 23 FFS trainors and was piloted in 5 barangays/communities in the municipality of Ubay last December 2004 to April 2005. In March 2005, there were 69 farmer-graduates from the pilot sites. There were 15 stable varieties and 3 segregating materials distributed for varietal selection in the 5 barangays/communities. After the FFS class, there were 21 rice crosses produced and 21 farmer-breeders.
SEARICE	Food Sovereignty Watch—discussion of issues and concerns on National Biosafety Framework (of Department of Environment and Natural Resources); and, issues and concerns (on-going/intensifying rice hybridization) on hybrid rice.
CBDC	CBDC (community biodiversity development and conservation program) – global program on PGRFA conservation, development and use

24. Training courses covering any of the 20 GPA priority activity areas received by the staff of your organization and specify the number of persons trained.

Stakeholder	**Name of training course**	**GPA activity areas addressed**	**Number of participating staff**
SEARICE	Southeast Asia Technical Training on Community Plant Genetic Resources Conservation and Development	1. Surveying and Inventorying PGRFA; 2. Supporting On-Farm Management and Improvement of PGRFA; 9 .1. Germplasm characterization and/or evaluation; 9.2. On-farm evaluation; 10. Increasing Genetic Enhancement and Base-Broadening Efforts; 10.1. Plant breeding; 11. Promoting Sustainable Agriculture through Diversification of Crop Production and Broader Diversity in Crops; 13. Supporting Seed Production and Distribution; 16. Promoting Networks for PGRFA	
SEARICE	Plant Genetic Resources Training		
SEARICE	National Information Sharing Mechanism on GPA implementation	17. Constructing Comprehensive Information Systems for PGRFA	
SEARICE	Farmers Technical Conference on Rice genetic Resources Conservation, Development and Use	3. Assisting Farmers in Disaster Situations to Restore Agricultural Systems; 9. Expanding the Characterization, Evaluation and Number of Core Collections to Facilitate Use; 9.2. On-farm evaluation; 10. Increasing Genetic Enhancement and Base-Broadening Efforts; 10.1. Plant breeding; 11. Promoting Sustainable Agriculture through Diversification of Crop Production and Broader Diversity in Crops	6
SEARICE	International Farmers Technical conference	2. Supporting On-Farm Management and Improvement of PGRFA; 9.1. Germplasm characterization and/or evaluation; 9.2. On-farm evaluation; 10. Increasing Genetic Enhancement and Base-Broadening Efforts; 10.1. Plant breeding; 11. Promoting Sustainable Agriculture through Diversification of Crop Production and Broader Diversity in Crops	1
SEARICE	International Farmers Conference Training	2. Supporting On-Farm Management and Improvement of PGRFA; 9.2. On-farm evaluation; 10. Increasing Genetic Enhancement and Base-Broadening Efforts; 10.1. Plant breeding; 11. Promoting Sustainable Agriculture through Diversification of Crop Production and Broader Diversity in Crops; 13. Supporting Seed Production and Distribution; 14. Developing New Markets for Local Varieties and 'Diversity-Rich' Products	4
SEARICE	Training of Trainors on PGR FFS	Supporting On-Farm Management and Improvement of PGRFA; 9. Expanding the Characterization, Evaluation and Number of Core Collections to Facilitate Use; 9.2. On-farm evaluation; 10. Increasing Genetic Enhancement and Base-Broadening Efforts; 10.1. Plant breeding; 13. Supporting Seed Production and Distribution	4