The **Consultative Group on International Agricultural Research** (CGIAR) is an informal association of 58 public and private sector members from countries worldwide and is co-sponsored by the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP) and the World Bank. It supports a network of 16 international agricultural research centres, located in 12 developing and 3 developed countries. The mission of the CGIAR is to contribute to food security and poverty eradication in developing countries through research, partnership, capacity-building, and policy support. The CGIAR promotes sustainable agricultural development based on the environmentally sound management of natural resources.

The **CGIAR System-wide Genetic Resources Programme** (SGRP) promotes collaboration among the genetic resources programmes and related activities of the 16 centres of the CGIAR: CIAT, CIFOR, CIMMYT, CIP, ICARDA, ICLARM, ICRAF, ICRISAT, IFPRI, IITA, ILRI, IPGRI, IRRI, ISNAR, IWMI, WARDA*. IPGRI is the Convening Centre and the InterCentre Working Group on Genetic Resources (ICWG-GR), with representatives from all centres and FAO, is the Steering Committee. The SGRP contributes to the global effort to conserve agricultural, forestry and aquatic genetic resources and promotes their use in ways that are consistent with the Convention on Biological Diversity. The SGRP seeks to advance research on policies, strategies and technologies for genetic resources, and to provide information, advice and training to national programmes.

The **International Plant Genetic Resources Institute** (IPGRI) is an autonomous international scientific organization, supported by the Consultative Group on International Agricultural Research (CGIAR). IPGRI’s mandate is to advance the conservation and use of genetic diversity for the well-being of present and future generations. IPGRI’s headquarters is based in Rome, Italy, with offices in another 14 countries worldwide. It operates through three programmes: (1) the Plant Genetic Resources Programme, (2) the CGIAR Genetic Resources Support Programme, and (3) the International Network for the Improvement of Banana and Plantain (INIBAP).

**Cover photo:** IPGRI/L. Sears

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ANNUAL REPORT 1998
of the CGIAR
System-wide
Genetic Resources
Programme
During 1998, the Technical Advisory Committee of the CGIAR (TAC) commissioned the first External Programme and Management Review of the System-wide Genetic Resources Programme. Under the leadership of Dr Jaap Hardon of the Netherlands, the team of five reviewers looked in-depth into a wide range of programmatic, managerial and governance issues. They provided a detailed analysis of the progress of the programme to date and made a total of 18 recommendations. A brief summary of the main findings of the review is given in this report, and the full document is available on request from the SGRP Secretariat. We would like to record our thanks to TAC for organizing this review and to the Review Panel for their hard work and helpful suggestions. Action has already been taken to implement the main recommendations of the review.

This is the first SGRP Annual Report to concentrate exclusively on the collaborative elements of the Programme and does not attempt to cover individual Centre activities. Details of Centres’ own activities on genetic resources are to be found in their respective annual reports.

This year, the SGRP was heavily involved with FAO in furthering regional and global programmes on plant and forest genetic resources, and in representing the CGIAR at a number of fora, including the fourth meeting of the Conference of the Parties to the Convention on Biological Diversity. We embarked on the further development of the System-wide Information Network for Genetic Resources (SINGER) and launched a new cooperative initiative on genetic resources training. Work continued to develop common policies and practices for managing genetic resources and to further collaborative research in key strategic areas. As this report shows, the activities of the SGRP in 1998 demonstrate significant progress towards more effective System-wide cooperation and greater impact in the CGIAR’s contribution to the global genetic resources effort.

We would also like to take this opportunity to thank the various donors who have so generously supported the programme in 1998. In particular we would like to mention the European Union, Japan, the Netherlands and the World Bank who supported the range of coordination and collaborative activities undertaken by the programme, and Switzerland and Australia who provided support specifically to the development of information systems.

Joel Cohen
Chair ICWG-GR

Geoffrey Hawtin
Programme Leader
THE EXTERNAL MANAGEMENT AND PROGRAMME REVIEW OF SGRP

Every five years, the CGIAR reviews each of its 16 member Centres. SGRP was the first System-wide programme to be established and, in 1998, the first to undergo the same process, an external programme and management review (EPMR). SGRP was established in 1994, as a result of a review that analyzed the role of the CGIAR in the post-UNCED environment. That review concluded that the CGIAR needed a more unified, transparent and accountable genetic resources effort in order to play a more effective role in the emerging global effort.

The EPMR Panel convened in January and completed its work in August. The review report was presented to the CGIAR at International Centres Week in October. The Panel examined the relevance, effectiveness and efficiency of SGRP and its accomplishments in the four years since its establishment.

In particular the Panel examined whether SGRP was meeting its chief goal of achieving greater coherence among the Centres in terms of their strategies for managing genetic resources and their positions on policy issues of relevance to the global conservation effort. The Panel concluded that while there had been good progress on this front, there was still a long way to go before the CGIAR would be in a position to meet global expectations. It recommended that SGRP continue, and proposed strengthening the programme operations and sharpening its focus still further to ensure more effective System-wide cooperation and a greater impact in the CGIAR's contribution to the global effort.

The EPMR advised the addition of a new governance structure for SGRP to enable more authoritative decision-making, particularly with regard to policy and strategic issues. A number of options were suggested for this governance structure. These are now under discussion by the CGIAR.

The review also recommended that SGRP assign priority to its objectives and activities, in order to achieve greater focus in the areas most critical for system-wide cooperation: policy, representation, information, public awareness and training. The CGIAR has a commitment, under the terms of the 1994 Agreements between the Centres and FAO, to meet certain obligations with regard to the in-trust collections of plant genetic resources and this commitment will be a major factor in guiding the definition of SGRP's priorities.

The Review observed that the CGIAR system has not yet determined the role that it should play in the global genetic resources effort, including the nature of its relationships with other stakeholders and networks. This observation led the Panel to propose a dialogue, both within the CGIAR and with other stakeholders, on its role in genetic resources conservation globally and specifically with regard to plant genetic resources for food and agriculture. The Review also made clear recommendations concerning the need to assess the effectiveness of the networks in which Centres participate and to clarify the aims of Centre conservation programmes.

The Review Panel was deeply concerned by Centre reports of funding constraints, resulting in delays in implementing the recommendations of the 1995 SGRP-commissioned review of Centre genebank operations. It strongly recommended that high priority be given to ensuring safety-duplication of the collections and appropriate standards in their management and to quantifying the costs of operations. The Panel called on the CGIAR to make funds available to enable the Centres to implement fully the recommendations of the 1995 review.
The International Centre for Research in Agroforestry (ICRAF) hosted the 8th annual meeting of the Inter-Centre Working Group on Genetic Resources (ICWG-GR) in January. The meeting addressed a number of strategic areas for furthering the programme of work of SGRP:

- policy formulation
- information management
- partnerships and external relations
- the global system for conservation
- ecosystem-based management of genetic resources
- capacity-strengthening and institutional issues
- understanding diversity
- biotechnology and biosafety.

The meeting drew up the annual work plan. A new phase in the development of the CGIAR System-wide Information Network for Genetic Resources (SINGER) and a System-wide initiative on training for managers of genetic resources programmes were launched. It was agreed to review Centre policies in managing the in trust plant collections and to undertake preparatory work on operational frameworks for a global genebank system and the applications of genomic research to genebank management. In addition, collaborative activities on the application of cryopreservation research and on forest and animal genetic resources conservation were initiated.

The SGRP Secretariat, hosted by IPGRI, supports the work of the ICWG-GR in its function as Steering Committee of SGRP. It also discharges IPGRI’s responsibilities as convening Centre and coordinates the support from IPGRI on policy and public awareness for SGRP. In 1998, a new project leader for SINGER joined the staff of the Secretariat.
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<th>No.</th>
<th>Centre Name</th>
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<tr>
<td>1</td>
<td>CIAT, Cartagena</td>
<td>Apdo. Aereo 6713, Cali, Colombia</td>
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<td>2</td>
<td>CIFOR, Bogor</td>
<td>Jalan CIFOR, Situ Gede, Sindangbarang, 16680, Indonesia</td>
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<td>3</td>
<td>CIMMYT, Mexico</td>
<td>Lipa 27, Apdo. Postal 6-641, 06600, Mexico, DF, Mexico</td>
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<td>4</td>
<td>CIP, Lima</td>
<td>Apdo. 1558, Lima 12, Peru</td>
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<td>5</td>
<td>ICARDA, Cali</td>
<td>PO Box 5466, Aleppo, Syrian Arab Republic</td>
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<td>6</td>
<td>ICLARM, Bogor</td>
<td>MC PO Box 2631, 0718, Makati City, Philippines</td>
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<td>7</td>
<td>ICRISAT, India</td>
<td>International Centre for Research in Agroforestry, Asni, Morocco</td>
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<td>8</td>
<td>IFPRI, Washington</td>
<td>2033 K St NW, Washington, DC, USA</td>
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<td>9</td>
<td>IRRI, Makati City</td>
<td>MCPO Box 3127, 1271 Makati City, Philippines</td>
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<td>11</td>
<td>IWMI, Colombo</td>
<td>PO Box 2075, Colombo, Sri Lanka</td>
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<td>12</td>
<td>IPGRI, Rome</td>
<td>Via delle Sette, Chiese 142, 00145 Rome, Italy</td>
</tr>
<tr>
<td>13</td>
<td>WARDA, Bouaké</td>
<td>01 BP 2551, Bouaké, Côte d’Ivoire</td>
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It has been widely recognized, not least by the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD), that the CGIAR has a critical role to play in the development of global programmes for the conservation and use of crop, forestry, livestock and aquatic genetic resources. SGRP coordinates the representation of the CGIAR and its contributions to international fora and global programmes concerning agricultural, forest and aquatic genetic resources. Key fora are those of the CBD and the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA). The Programme’s contributions to these and other relevant programmes and fora in 1998 are detailed on the following pages.

Fourth Meeting of the Conference of the Parties (COP4) to the Convention on Biological Diversity (CBD)

The fourth meeting of the Conference of the Parties (COP4) took place from 4 to 15 May in Bratislava, Slovak Republic, preceded by the 10th Global Biodiversity Forum. The CGIAR delegation on the management of plant genetic resources by the CGIAR provided the opportunity to clarify the status of the collections, the provisions of the KO Agreements on access and intellectual property rights (IPR), and the issues that had led to the CGIAR’s call for a voluntary moratorium on IPR claims on germplasm designated under the KO Agreements, just prior to the COP meeting. A paper prepared on behalf of SGRP, by IPGRI, entitled “Sharing the non-monetary benefits of agricultural biodiversity”, was included among the official COP information documents. It was noted by a number of delegates as a useful document in raising awareness of the issues in attributing benefits in the case of domesticated species and of the range of benefits, other than financial, that can be derived through the open exchange of agricultural genetic resources.
The CGIAR booth in the exhibition area drew many delegations for informal discussion with the CGIAR staff. The booth featured posters and publications on aquatic genetic resources and on SGRP, and a computer allowed access to CGIAR websites.

The Center for International Forestry Research (CIFOR), ICLARM and the CGIAR System as a whole, are recognized by the COP as important partners in the implementation of its work programmes on forest biodiversity, aquatic ecosystems (marine and coastal, and inland) and agricultural biodiversity, respectively.

For SGRP, coordinating a strong CGIAR contribution to the work programme on agricultural biodiversity – which covers crop, livestock and agroforestry genetic resources – is of particular importance. It facilitated the participation of scientists from CIP (Centro Internacional de la Papa) and ICRAF (International Centre for Research in Agroforestry), together with IPGRI, in a workshop in November organized by FAO and the CBD Secretariat on the development of the CBD agricultural biodiversity programme. In its activities, SGRP is attempting to respond to the emphasis on an ecosystem approach and biodiversity assessment.

Lake Tonle Sap in central Cambodia and its unique relationship with the Mekong river to which it is linked by the river Tonle Sap, has a special and fascinating role in the agriculture and fisheries of the country. When the Mekong swells in the rainy season, its delta cannot handle the enormous volume of water and the floodwaters back-up, reversing the flow of the Tonle Sap river and causing the lake to increase in size, threefold. This phenomenon provides irrigation and fresh, fertile silt for rice cultivation, and flooded forest habitats for aquatic life that enrich the lake’s fish resources.

Confluence of the Mekong and Tonle Sap rivers at Phnom Penh, Cambodia. IPGRI/J. Toll
methods, contained in all of the CBD sectoral work programmes. In the development of SINGER, close contact with progress in the CBD Clearing House Mechanism (CHM), at international and national levels, is also important.

First Session of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture

The CGIAR was represented at the First Session of the Intergovernmental Technical Working Group on Animal Genetic Resources by staff of the International Livestock Research Institute (ILRI), the International Center for Agricultural Research in the Dry Areas (ICARDA) and IPGRI. The Working Group, which reports to the FAO Commission, reviewed the development of the Global Strategy for the Management of Farm Animal Genetic Resources, which was initiated by FAO, and made recommendations to go before the next regular session of the CGRFA, for the preparation of a Report on the State of the World’s Animal Genetic Resources, on the strengthening of FAO’s lead role and on the country and regional structures for implementing the Global Strategy.

The meeting provided the opportunity to examine the contribution that individual Centres and SGRP can make to furthering the Global Strategy. The work ICARDA is initiating with support from SGRP – on the characterization of local breeds of small ruminants in the West Asia and North Africa (WANA) region – will be closely coordinated with the national partners and work plan of the Global Strategy. Other areas of collaboration are database links between the ILRI system and SINGER to the Domestic Animal Diversity Information System (DAD-IS) at FAO, which is a primary component of the Global Strategy, and also in CGIAR contributions to the preparation of the State of the World Report.
International Conference on Policies for Conservation and Sustainable Use of Aquatic Genetic Resources

Following a recommendation of the SGRP consultation on Fish Genetic Resources in 1995 (SGRP Annual Report 1995), ICLARM, in association with FAO, organized in April an international conference titled “Towards Policies for Conservation and Sustainable Use of Aquatic Genetic Resources” at the Bellagio Conference and Study Center of the Rockefeller Foundation, Italy. IPGRI staff also attended the Conference, making contributions in the areas of policy and public awareness. The meeting proposed a series of actions to strengthen education, information-sharing, institutional structures, policies and approaches for implementing the objectives of the CBD in relation to aquatic genetic resources. Follow-up activities are underway between ICLARM and FAO to develop proposals for a global strategy for aquatic animal genetic resources, and in particular for the development of an aquatic animal diversity information system. These developments will guide SGRP’s future work in this area.

Contribution to the implementation of the Global Plan of Action for Plant Genetic Resources

The landmark 1996 International Technical Conference in Leipzig adopted the Global Plan of Action (GPA), a mandate for the conservation and sustainable use of plant genetic resources for food and agriculture. As part of SGRP’s continuing commitment to the Global Plan, the Programme co-sponsored with FAO a series of regional meetings to assess the status of implementation of the GPA at the local, national and regional levels and to identify strategies to strengthen implementation activities.

On behalf of SGRP, IPGRI helped FAO to organize meetings in the following
regions: Asia and Pacific; Central and West Asia and North Africa; East and Southern Africa; West and Central Africa; Latin America and the Caribbean.

The meetings brought together representatives from government, NGO, regional and international institutions, including FAO and CGIAR. They focused on three major themes and came to the following general conclusions:

**National programmes, strategies and policies**
- Each country should have a strategy for plant genetic resources conservation and use and form a national committee with broad stakeholder involvement
- Countries should recognize the importance of raising awareness of genetic resources issues
- Countries should institute disaster recovery programmes for farmers.

**Community PGRFA management**
- The meetings confirmed the important role of farmers, local communities and NGOs in conservation and sustainable use of plant genetic resources and the need to enlist their participation
- Documentation of local and indigenous knowledge should be strengthened
- The public should be made aware of the importance of genetic diversity and variability

**Regional and international collaboration**
- Regional projects should be launched in collaboration with national programmes
- Germplasm exchange should be facilitated through crop-specific networks that extend across regions
- Existing genetic resources networks and organizations should be encouraged to collaborate with other geopolitical groups and the private sector
- Documentation efforts should be integrated and take advantage of electronic networking and information technology systems like SINGER.

The meetings also reported unique developments and initiatives taking place in the respective regions. The Latin America and the Caribbean group agreed on activities that will improve regional cooperation. The Network on Genetic Resources for West and Central Africa (GRENEWEC) was established. The Asia and the Pacific group proposed placing national ex situ collections under a regional collection agreement. The countries in Central and West Asia and North Africa expressed willingness to share responsibilities for their ex situ collections. Repatriation of germplasm at local and national levels was an important issue for East and Southern Africa.

In many countries some type of strategy for conservation and sustainable use of plant genetic resources for food and agriculture had been set in place, but full effectiveness of the GPA was lacking. Regions identified similar constraints such as lack
of secure funding base, public awareness, qualified human resources and coordination between stakeholders. The participants noted that the challenges of full implementation demand integrated efforts from the various stakeholders. Initiatives to secure funding will require designing clear, competitive projects that are attractive to donors and include many beneficiary stakeholders. Partnerships with the private sector will also contribute to creating more public awareness and funding possibilities. SGRP and FAO can help with public awareness efforts that will encourage policy-makers to create frameworks for the equitable management of PGRFA. SGRP can help develop human resources capabilities and expertise. The Programme can also promote closer collaboration between the Centres and regional efforts for better coordination that extends to the inter-regional level.

Assisting Farmers in Disaster Situations to Restore Agricultural Systems (GPA Priority Activity 3)

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) represented SGRP in an international workshop at FAO headquarters in November, which brought together aid agencies and agricultural research and development organizations, to address a priority GPA activity: the development of institutional agreements and capacities to assist farmers in disaster situations to restore agricultural systems. Scientists from CIAT (Centro Internacional de Agricultura Tropical), IITA (International Institute of Tropical Agriculture) and IPGRI were also involved in the meeting. The essential role of genebanks, inventories of local crop genetic resources, mechanisms for procurement, multiplication and distribution of quality seed of adapted varieties, and harmonization of seed regulations, were among the recommendations. Internally, SGRP is considering how it can ensure a coordinated System contribution to this activity and its role with respect to minor crops.

A plan of action for forest genetic resources in the Sahel

Fifteen nations in the Sahel region of Africa agreed to prepare a subregional plan of action for the conservation, management, sustainable use and enhancement of forest genetic resources, marking an important step toward a global plan of action. SGRP provided support to the organization and preparation of the workshop, as part of its commitment to the development of regional and global programmes for forest genetic resources.

The delegates met in September at a workshop organized by FAO in collaboration with IPGRI and ICRAF. In addition to the 15海湾
country delegations, FAO, IPGRI and ICRAF, and representatives of six partner agencies attended the “Workshop on the Conservation, Management, Sustainable Utilization and Enhancement of Forest Genetic Resources in Dry-Zone Sub-Saharan Africa,” hosted by the Centre National des Semences Forêtières, Burkina Faso.

The 15 countries that participated in the workshop were Benin, Burkina Faso, Cameroon, Chad, Côte d’Ivoire, Eritrea, The Gambia, Guinea, Kenya, Mali, Mauritania, Niger, Senegal, Sudan and Togo. The partner agencies that participated included FAO, IPGRI, ICRAF, CIRAD-Forêt, Danida Forest Seed Centre, IRAD-Cameroon (Institut de la Recherche agricole pour le développement), IUCN and the International Union of Forestry Research Organizations (IUFRO).

In preparation for the workshop, countries were assisted with the task of assessing the status of their forest genetic resources. National reports from 12 countries outlined key issues and priority species, with recommendations for overcoming constraints. A draft synthesis of the 12 national reports was prepared.

A regional training course, held prior to the workshop, offered instruction on the conservation and sustainable use of forest genetic resources. Organized by IPGRI in collaboration with FAO, Danida Forest Seed Centre and CIRAD-Forêt and others, the course emphasized the need for country-driven action at the national and regional levels. Participants recommended that IPGRI, in collaboration with other organizations, develop a regional programme for forest genetic resources in Sub-Saharan Africa (SAFORGEN). The regional programme...
would initially include four networks: fruit and food tree species, fodder tree species, African timber and wood species, and African non-timber forest products.

Delegations presented their national reports and discussed the draft synthesis report during the workshop. They began to prepare a subregional plan of action focused on three objectives: improved management and use of forest genetic resources (resource assessment, conservation and sustainable use); increased availability of superior germplasm (supply, selection and improvement); and enhanced institutional capacity (awareness-building, training, institution-strengthening). Delegates strongly endorsed IPGRI’s efforts to establish SAFORGEN, recognizing that once operational, it would be a useful platform for implementing activities of the subregional action plan.

In 1999 FAO, in collaboration with IPGRI and ICRAF, will finalize and publish the synthesis report on the state of forest genetic resources in the Sahel, and the subregional Plan of Action prepared at the workshop. As recommended by the workshop, FAO, together with the partner organizations, will promote the implementation of the regional plan of action through appropriate mechanisms and encourage the organization of similar action-oriented, country-driven workshops in other regions of Africa.

Pulling fronds from Borassus aethiopicum for fibre. The tree is also used as a source of sugar, medicine and building material. IPGRI/I. deBorhegyi
POLICY REVIEW AND FORMULATION

A key task for SGRP is to review and recommend genetic resources policies for System-wide adoption that are in harmony with international agreements. This involves formulating policy instruments and internal guidelines for the Centres to use for the acquisition, management, use and transfer of agricultural genetic resources, including forest and aquatic resources, and monitoring their implementation.

The Centres hold more than 500,000 accessions of plant genetic resources in trust (known as ‘designated germplasm’) for the international community under agreements signed between the Centres and FAO in 1994. The development and implementation of appropriate and consistent System-wide policies and practices for administering these collections in accordance with the terms of the FAO Agreements are priorities for SGRP.

In 1998, SGRP conducted a review of the Material Transfer Agreements (MTAs) that the Centres use to bind recipients of designated germplasm to the terms of the FAO Agreements and requested that IPGRI develop a standard MTA with the advice of FAO. IPGRI was also requested to consult with FAO on a number of technical and management issues relating to the implementation of the FAO Agreements, and to review Centre practices on the designation of in trust germplasm and on the acquisition of plant genetic resources.

During the year, a great deal of public attention centred on the MTAs, in particular concerning their prohibition against the application of intellectual property rights on designated germplasm. Led by IPGRI, SGRP and individual Centres investigated a number of alleged violations of MTAs in this regard. In May, the CGIAR released a statement describing the actions that Centres would take when they had reason to believe that an MTA had been violated. The statement has now been formally agreed with FAO.

A new standard Material Transfer Agreement for in trust germplasm

The new MTA binds recipients to certain terms and conditions on accepting the germplasm samples, without requiring a signature or further action by the recipient. It has been formally approved by FAO and, at International Centres Week, the CGIAR approved the system-wide implementation of this standard MTA (see Box on page 14).

In consultation with FAO, SGRP developed a series of steps that Centres must follow in using the new MTA; these will go before the ICWG-GR at its Annual Meeting in January 1999 for endorsement and implementation. The new MTA will be presented to the FAO Commission on Genetic Resources for Food.
The material contained herein is being furnished by [Centre] under the following conditions:

Designated Germplasm

[Centre] is making the material described in the attached list available as part of its policy of maximizing the utilization of genetic material for research. The material was either developed by [Centre]; or was acquired prior to the entry into force of the Convention on Biological Diversity; or if it was acquired after the entering into force of the Convention on Biological Diversity it was obtained with the understanding that it could be made freely available for any agricultural research or breeding purposes.

The material is held in trust under the terms of an agreement between [Centre] and FAO, and the recipient has no rights to obtain Intellectual Property Rights (IPR) on the germplasm or related information.

The recipient may reproduce the seed and use the material for agricultural research and breeding purposes and may distribute it to other parties provided the recipient is also willing to accept the conditions of this agreement.

The recipient, therefore, hereby agrees not to claim ownership over the germplasm to be received, nor to seek IPR over that germplasm or related information. He/She further agrees to ensure that any subsequent person or institution to whom he/she may make samples of the germplasm available, is bound by the same provision and undertakes to pass on the same obligations to future recipients of the germplasm.

[Centre] makes no warranties as to the safety or title of the material, nor as to the accuracy or correctness of any passport or other data provided with the material. Neither does it make any warranties as to the quality, availability, or purity (genetic or mechanical) of the material being furnished. The phytosanitary condition of the material is warranted only as described in the attached phytosanitary certificate. The recipient assumes full responsibility for complying with the recipient nation’s quarantine/biosafety regulations and rules as to import or release of genetic material.

Upon request, [Centre] will furnish information that may be available in addition to whatever is furnished with the seed. Recipients are requested to furnish [Centre] performance data collected during evaluations.

The material is supplied expressly conditional on acceptance of the terms of this agreement. The recipient’s acceptance of the material constitutes acceptance of the terms of this agreement.

* This does not prevent the recipient from releasing or reproducing the seed for purposes of making it directly available to farmers or consumers for cultivation, provided that the other conditions set out in the MTA are complied with.
Agriculture for endorsement, at its 8th Session in April 1999. At this time, official translations of the MTA in all UN languages will be available.

Policies and procedures relating to the implementation of the Centre/FAO Agreements governing the in trust plant germplasm collections

FAO and SGRP reached a common understanding on a number of procedures that Centres must follow under the Agreements (for example when they become aware of violations of their MTAs, as described above). These have been formally approved by FAO and are contained in the "Second Joint Statement of FAO and the CGIAR Centres designing germplasm under the FAO Agreements and for acquiring it in conformity with the requirements of the CBD. These internal and practical guides will help SGRP to ensure that Centre practices are appropriate and consistent. The guidelines for the designation of germplasm in trust were accepted for System-wide use by the CGIAR at ICW98. The guidelines for the acquisition of plant genetic resources will be reviewed by the ICWG-GR at its Annual Meeting in January 1999.
SECOND JOINT STATEMENT of FAO and the CGIAR
Centres on the Agreements placing CGIAR germplasm collections under the auspices of FAO

The Statement addresses two issues: enforcement of the MTA for the transfer of designated germplasm, and management procedures for the distribution and designation of germplasm. In summary, the main points of the Statement are:

1. Actions to enforce the MTA
   It is understood that the Centres cannot guarantee that recipients of germplasm will abide by the MTA, but it is agreed that the Centres will voluntarily take the following actions in response to a perceived violation of their MTA:
   - clarify the situation with the recipient of the germplasm, notifying them of the possible violation and requesting them to renounce or desist in claiming IPR on the designated germplasm
   - notify the regulatory body in the country where the possible violation has occurred, bringing to their attention that the granting of IPR may have been inappropriate
   - notify the FAO Commission on Genetic Resources for Food and Agriculture of the possible violation.
   The Centres will urge that no IPR be sought for designated germplasm distributed prior to its designation under the FAO Agreements.

2. Procedures in distributing and designating germplasm
   Centres make samples of designated germplasm available to users for the purpose of scientific research, plant breeding or genetic resource conservation, without restriction (Article 9: FAO Agreements). It is understood that this undertaking extends only to reasonable requests for these specific purposes and that sound management practices as well as practical and biological constraints may make it inappropriate or difficult for Centres to provide germplasm. Centres are not obligated:
   - to distribute samples that could pose risks for the spread of pests and diseases
   - to supply quantities which exceed basic requirements for the purposes stated under Article 9
   - to guarantee the immediate or cost-free availability of all designated germplasm, for example, where stocks are limited or the supply of material is constrained (as may be in the case of wild, woody and vegetatively propagated species).
   When a Centre cannot fully or immediately meet a request, the Centre will inform the requestor of the reasons and discuss plans for the supply of the materials.
   It is understood that the status of germplasm as “designated” becomes effective immediately upon the Centre determining that it is designating and managing the germplasm under the terms of the FAO Agreements. As management and information systems improve and as genomic information about accessions becomes available, Centres will update the list of germplasm covered by the FAO Agreements. FAO will be notified if there are cases of an accession losing viability, the duplicate designation of an accession, or an error in an accession’s registration number. In compliance with Article 2 of the Agreements, additional designations will be consolidated into updated lists, which will be provided to FAO every two years, or more frequently as appropriate.
The CGIAR System-wide Information Network for Genetic Resources (SINGER) entered into a second phase of development in 1998 that will enable it to better contribute to the global information exchange on genetic resources. The new agenda seeks to transform SINGER into a gateway to the full range of genetic resources related information available within the CGIAR and link SINGER with the information systems of other organizations.

SINGER links the genetic resources information systems of the individual Centres of the CGIAR around the world, allowing them to be accessed and searched collectively. SINGER contains key data on the identity, source, characteristics and transfers to users of more than half a million individual accessions of crop, forage and agroforestry genetic resources held in the Centre genebanks. In 1997 it became available on the World Wide Web (WWW) and on CD-ROM (SGRP Annual Report 1997, page 9).

The continued strong support of Switzerland and assistance from other donors to SGRP (European Union, Japan and The Netherlands), has made possible SINGER’s improvement and further development.

Objectives
The planning for the further development of SINGER was undertaken at a meeting held from 9 to 14 November 1998, hosted by FAO. The 60 participants included the genetic resources and information specialists from the CGIAR Centres and experts from developing and developed country institutions, the private sector, NGO community FAO and the Clearing House Mechanism (CHM) of the CBD.

The meeting addressed the four principal objectives for the new direction of SINGER:
- to increase the awareness, use and user responsiveness of SINGER
- to expand SINGER to include the full range of data available on the plant germplasm collections as well as CGIAR databases related to forest, livestock and aquatic genetic resources
- to link to databases and information systems outside of the CGIAR
• to contribute to the development of global genetic resources information systems.

Based on the recommendations made at the meeting, the project team outlined and prioritized the technical improvements and tasks necessary for SINGER to achieve its objectives. Highest priority will be given to actions that increase the quality and quantity of data available on the plant genetic resources collections, and to improvements to SINGER’s user access and query functions. Ensuring access to complete and reliable passport, characterization and evaluation data on the plant germplasm collections, and improvement of the user-interface, are critical steps to increasing the use and usability of SINGER and a prerequisite to forging links with national and international information systems.

Plan of Action
Future development will focus on SINGER’s role as an entry point to the genetic resources databases available within the CGIAR and as a facilitator of their diffusion and links with collaborators’ databases. In its technical structure, SINGER will head toward becoming a highly flexible platform that can accommodate the independent structure of the component Centre databases with minimum requirements for standardization to enable across-database searches. Retaining the autonomy in design and management of the individual databases accessible through SINGER is critical for ensuring the sustainability of SINGER. By reducing its compatibility requirements, SINGER will facilitate creating links to collaborators’ information systems.

A software package – a “tool kit” – that provides a flexible means of publishing databases on the WWW and CD-ROM will be developed. The “tool kit” will be used to design a more user-friendly interface for SINGER that is highly responsive in its query functions to the specific needs of the user. Graphic and mapping capabilities will allow the user an overview of the contents of SINGER and help the user to better target queries.

Using the “tool kit” developed by the SGRP SINGER project, Centres will be able to publish their individual databases on the WWW and CD-ROM both independently and through SINGER. Thus, the full range of accession-level data will be available on the characterization and evaluation of the plant germplasm collections, as well as access to Centre databases related to forest, aquatic and livestock genetic resources, such as DAGRID (the ILRI Domestic Animal Genetic Resources Information Database) and FishBase (the International Biological Database on Fish, managed by ICLARM). Linking SINGER to an initiative led by CIMMYT (Centro Internacional de Mejoramiento de Maíz y Trigo) “The International Crop Information System” (ICIS) which assembles information on the pedigrees and performance of improved germplasm lines, is the focus of a special project (see page 20).
In meeting SINGER’s goal to contribute to the global exchange of genetic resources information, data quality and common standards for data exchange are vital. In particular, importance will be given to improving the completeness and accuracy of the data relating to the identity and geographical source of the plant germplasm collections. This will help establish accession-level links with national and other databases and provide users with additional indicators of the value of the germplasm samples through association with Geographic Information Systems. The SINGER project will collaborate with FAO and other organizations to develop and promote common data standards to ensure compatibility between national and international information systems. For example, to harmonize the taxonomy it uses with that of other systems, SINGER will use authoritative taxonomic references such as Species 2000.

Pilot studies to explore the feasibility for links to national programme databases and those of regional networks will be launched. SINGER will develop links to FAO World Information and Early Warning System (WIEWS) and the Clearing House Mechanism of the CBD. In addition, initiatives will be made to raise awareness and proficiency among key user groups of SINGER. Existing CGIAR training programmes will integrate the application of SINGER structure and tools and guidance on standards and protocols for data exchange into their curricula.

**Progress**

By the end of the year, work had started on developing the “tool kit” for SINGER. Also, action had been initiated to upgrade the capacity of the SINGER data-delivery mechanism, institute a policy for the operation of SINGER and address critical needs in data quality and standards. A newly improved SINGER user-interface will be released on the WWW in mid-1999. Centre databases on the characterization and evaluation of the plant germplasm collections will progressively come on-line during the latter part of the year. These developments are preparing the way for SINGER to provide access to a wider range of genetic resources information available within the CGIAR, and to promote links with national and other genetic resources information systems.
The International Crop Information System (ICIS)

The International Crop Information System (ICIS) is a data management system for integrating independent sources of performance data and related information on crop varieties and lines. Its core is the management of pedigrees and the unique identification of the germplasm components. Databases are being established for rice, cowpea and other major crops within the mandates of CGIAR Centres, following the model of CIMMYT’s International Wheat Information System (IWIS).

ICIS is an interCentre initiative, led by CIMMYT. Since 1996, SGRP has provided funds to assist the development of ICIS, in recognition of its potential value to crop breeders and to facilitating the use of genetic resources in conjunction with SINGER (SGRP Annual Reports 1996 and 1997).

In 1998, SGRP supported the further development of ICIS by helping to secure a grant from Australia for a project aimed at improving the ICIS data management modules and developing connections with SINGER and other genetic resources information systems (e.g. GRIN, the Genetic Resources Information Network of the US National Germplasm Resources Program).

During the year, progress was made to improve key functions of ICIS in managing and displaying crop pedigrees. Improvements reduced the query response time for displaying genealogical dendrograms. The function for searching for descendants within multiple pedigrees was further developed and successfully tested on the ICIS wheat, rice, maize and barley databases. Further work is planned to provide an option for users to limit search results to released cultivars.

Improvements were made to the module that manages and verifies performance-related data obtained from multiple sources. In addition to providing data on traits, the module can support bibliographic information on records from the institutions that run trials.

A prototype module was developed for importing data on genetic resources samples into ICIS. It was tested on IRRI rice collection data available in SINGER. In addition, links with GRIN were established for 18,000 rice accessions. Further work will be conducted to establish a two-way connection between ICIS and SINGER that will allow the association of records on genetic resources with the pedigrees of crop varieties and lines.

Further information on the developments in ICIS is available at: <http://www.cgiar.org/icis>.
Human Resources Development for the Managers of Genetic Resources Programmes

SGRP is developing a coordinated approach within the CGIAR for supporting human resources development in the area of genetic resources. In 1998, it launched an initiative for inter-Centre collaboration in the development and provision of training for managers of genetic resources programmes. The focus on programme management was selected to give greater attention to policy and institutional issues in the training of national programme leaders and for its relevance to all sectors of genetic resources activity, including crop, forest, livestock and aquatic genetic resources.

The initiative is being led by the International Service for National Agricultural Research (ISNAR), following the model used for developing the ISNAR training course *Managing Biotechnology in a Time of Transition*. The overall objective of the project is to improve the efficiency, effectiveness and sustainability of national genetic resources programmes by strengthening the capacity of national programme leaders to manage their programmes, and conduct research and related training.

Work began by preparing and conducting a survey of the existing genetic resources training opportunities and resources available within the CGIAR. Based on the survey findings, the project determined possible future training objectives and areas and, by the end of 1998, was in the process of analyzing the relevance of existing training materials and defining possible curricula on genetic resources programme management.

The questionnaire for surveying CGIAR genetic resources training activities was designed by ISNAR and IPGRI. Responses from CIMMYT, CIP, ICLARM, ICARDA, IITA, ILRI, IPGRI and IRRI have been analyzed. These show that Centres are involved in genetic resource-related human resources development, mainly through the provision of short training courses. They have training strategies and most are using informal means of assessing the training needs of national partners and external trainers. Although all of the Centres currently evaluate their training activities, only three do post-training follow-up or impact assessment of their training activities. All of the Centres have training materials and some have developed course modules.

Most of the existing Centre training courses and materials are mainly technical in content. Topics related to genetic resources policy and management are less prominent. The most common policy and management-related areas include: the implications to managers of biodiversity and genetic resources issues; genetic resources communication and information; analysis of the...
resources available for research; environmental responsibility and biosafety. Managing intellectual property rights, priority-setting, negotiation skills and managing human resources development for genetic resources were included in training activities of one or two Centres.

The next phase of the project will be to design and conduct an assessment of national programme training needs to gather feedback on the appropriateness of the proposed content of the training module.

Existing training needs assessments have been consulted. These include a survey of degree-level training needs among national genetic resources programmes in the Asia and Pacific region conducted by IPGRI in 1995, and assessments of NARS research management training needs undertaken by IWMI (the International Water Management Institute) and ISNAR. Based on these and the results of the Centre survey, the objectives for future training for leaders of genetic resources programmes were identified. They include: developing and implementing policies for genetic resources conservation and use at national and institutional level; defining and practising leadership and management of a genetic resources conservation and research programme; and identifying and applying new technical knowledge and skills in genetic resources conservation and research.

Three possible curricula for a training module on the management of a genetic resources programme have been defined. Following incorporation of the suggestions of the ICWG-GR, a final set of test curricula will be developed for the training needs assessment exercise to obtain the feedback of NARS and other partners on the appropriateness of the proposed content.

Technical training in seed processing and testing methods, ICRISAT Sahelian Center, Niger. IPGRI
Inter-Centre collaboration in the application of cryopreservation for long-term conservation of plant genetic resources

Cryopreservation, the storage of biological material at ultra-low temperatures (in liquid nitrogen at −196°C) is currently the only solution for safe and cost-effective long-term conservation of vegetatively propagated crops and recalcitrant-seeded species (species whose seeds cannot be conserved by orthodox seed storage methods). Today cryopreservation protocols have been established for more than 200 different plant species. However, the development of the technology is much more advanced for vegetatively propagated crops, from which the apices or shoot tips can be frozen, than for recalcitrant-seeded species. Furthermore, although there are now a number of crops for which cryopreservation techniques exist, systematic application of these methods and experimentation on germplasm collections is limited.

Cryopreservation is important to CGIAR Centres holding international collections of major food crops that are vegetatively propagated: Centro Internacional de la Papa (CIP) for potato, sweet potato and Andean root and tuber crops, Centro Internacional de Agricultura Tropical (CIAT) for cassava, International Institute of Tropical Agriculture (IITA) for cassava and yam and IPGRI/International Network for the Improvement of Banana and Plantain (INIBAP) for Musa. In view of the direct relevance of cryopreservation to these Centres and its potential value to national genetic resources programmes, SGRP is promoting greater inter-Centre collaboration to further this strategic area of conservation research.

The CGIAR Centres have made an important contribution to the development of cryopreservation protocols for
tropical species, and in particular for the crops they conserve. Each Centre has started to establish cryopreserved collections and/or to perform extensive experiments on different species and genotypes of the crops they hold. However, in the case of sweet potato, more work is needed before cryopreservation can be routinely applied to the germplasm collections, and work on the Andean root and tuber crops is still in a research phase.

In 1998, SGRP provided funds that allowed scientists from CIP, CIAT, IITA and IPGRI/INIBAP to participate in an international workshop on the cryopreservation of tropical plant germplasm in Tsukuba, Japan, and to remain for an extra day to plan collaborative initiatives. IPGRI, which co-organized the workshop with JIRCAS (Japan International Research Center for Agricultural Sciences), arranged this inter-Centre meeting.

At the inter-Centre meeting, the scientists agreed on an agenda for collaborative work, focusing on the following elements:

- Further developing and refining cryopreservation protocols for root and tuber crops and *Musa*
- Testing protocols on a wide range and large quantity of species and genotypes of each crop
- Establishing procedures for optimal management of cryopreserved collections
- Analyzing the costs of cryopreservation and collection management procedures
- Developing strategies to integrate cryopreservation with other methods of conservation (field, *in vitro*, seed) in the most cost-effective manner to ensure preservation of the genepool of a given crop and its availability for use
- Establishing arrangements between Centres and with NARS for the safety-duplication of cryopreserved collections
- Networking within regions, between Centres and national programmes to concentrate on technology development, transfer and capacity-building
- Coordinating links with institutes conducting fundamental research.

It was decided to develop a joint proposal to forward the agenda. The Centres also agreed to communicate consistently about cryopreservation and to seek opportunities to share techniques and expertise.
Conservation of forest genetic resources: impacts of forest fragmentation

Deforestation frequently results in the formation of forest fragments set in unforested, or less forested, areas. Many of the benefits conferred by forests – ecological, social, economic – are closely linked to the viability of these forest fragments. An SGRP-supported project is examining the effects of fragmentation on the maintenance of genetic diversity in a forested area of northeastern Costa Rica. The results of this research will inform the design of management strategies for forest genetic resources.

The study, begun in 1996, is being carried out by the Tropical Agronomic Centre for Research and Education (CATIE), with support from the Center for International Forestry Research (CIFOR) and IPGRI. It is assessing the impact of fragmentation on the genetic diversity of tree species present in the fragments. In particular the study is determining the circumstances in which the levels of geneflow between fragments are likely to be sufficient to counteract the expected effects of fragmentation-induced genetic drift for different tree species and types of fragment. In what circumstances fragmentation reduces outcrossing rates should become clear, as well as the effects of such decreases on population viability.

Reduced geneflow and increased genetic drift are issues of great strategic importance, as they can lead directly to the loss of genetic diversity. Decreased fitness, due to increased inbreeding in fragments, will reduce population viability and may lead to extinction. Trees are the predominant components of the physical and biological environment in which other elements of forest biodiversity survive and reproduce. Therefore, the effects of
fragmentation on the genetic diversity of tree populations eventually affect species-level and ecosystem-level biodiversity.

The study is concentrating on three species \textit{Anacardium excelsum, Astronium graveolens, Plumeria rubra} which have different characteristics, and possibly different responses to fragmentation. The comparison across species provides valuable information to isolate the factors that predispose populations to fragmentation-induced drift and inbreeding.

In 1998, work in the 350-km$^2$ zone focused its study on gene flow. The initial work of locating, mapping and sampling the study populations (described in the 1997 SGRP Annual Report) was expanded to locate additional populations of the study species. Additional seed collections were made of \textit{A. excelsum} and \textit{P. rubra} and new aerial photographs, maps and documents clarified the history of the study zone. More than 1000 individual explanatory data values have now been taken, mostly at the individual-tree level: fragment flowering indices, species diversity indices, flowering plant densities, distance to fragment edge, matrix type, degree of isolation, conspecific population density, tree flowering indices, etc. The CATIE nursery has established 138 progenies of \textit{A. excelsum} in order to examine the relationship between heterozygosity and fitness.

Allozyme studies of \textit{A. excelsum} have been initiated. Enzyme-extraction protocols for use with leaf material were developed and trials were made with different enzymes and running systems, resulting in the final selection of two systems [histidine/tris citrate, pH7.0; tris citrate (pH8.5)/lithium borate (pH8.1)]. In addition, over 3000 leaf samples of \textit{A. excelsum} have been silica-dried for subsequent DNA extraction and analysis.

Synthesis and publication of the results of the study will begin in mid-1999.

**Costing the Ex Situ Conservation of Genetic Resources: Maize and Wheat at CIMMYT**

The External Review of CGIAR Genebank Operations, commissioned by SGRP in 1995, recommended that cost analyses be conducted of the Centre genebank operations. In response, SGRP commissioned the International Food Policy Research Institute (IFPRI) in 1996 to undertake a study of the costs of operating a genebank and thereby develop a methodology to cost other genebanks as a basis for improving the efficiency of their operations and the CGIAR System as a whole.

A pilot study was conducted on the CIMMYT genebank. A draft version was completed in 1998 and reported in Pardey et al. (1998).* A revised version of the complete study will be published by IFPRI in 1999 in its “Environment and Production Technology Division Discussion Paper” series.

Background
CIMMYT holds collections of maize, wheat and other small-grained cereals (barley, rye, triticale). In 1997 the collections totaled 140,000 accessions, including handcars, cultivars, breeding lines and wild related species. The germplasm accessions are stored as seed in a single genebank facility where they are managed as two separate collections: maize (17,000 accessions) and wheat (123,000 accessions, including barley, rye and triticale). The two collections at CIMMYT provided the opportunity to compare conservation costs for different types of crop: maize is large-seeded, outcrossing, and has highly heterogeneous germplasm, whereas wheat and the other cereal species are small-seeded, inbreeding, and typically homogeneous.

The study spanned the operations involved in building, conserving and disseminating a germplasm collection; specifically the safe storage of the material, regeneration of accessions, monitoring and maintaining seed health, data management, safety-duplication, and the shipment of samples to collaborators worldwide. The CIMMYT genebank – a new facility constructed in 1996 – consists of a long-term storage facility (−18°C) and a medium-term storage (−1°C and 30% RH), plus ancillary facilities including a seed-drying room, seed processing and testing laboratories, and offices.

The framework to estimate the costs for the genebank operations is borrowed from production economics, in which outputs (in this case, services provided by the genebank) are derived from some combinations of inputs. For example, inputs such as labour, land, buildings, capital equipment, energy and...
acquired seeds are used to produce outputs such as stored seeds and relevant documentation for distribution to national programmes and other users. In addition to generating comprehensive estimates of the total annual costs of conserving wheat and maize genetic resources at CIMMYT, the study investigated the economies of size, scale and scope in the operations of a genebank.

Genebank costs were categorized into variable (operational) and fixed (capital) costs as a basis for distinguishing between average and marginal costs. The variable costs involved expenses that were often sensitive to the scale of the operation, such as the costs for labour, electricity and chemicals. Capital costs are those incurred on a periodic (greater than one year) basis such as the costs for construction of the storage facility and physical plant, and laboratory and office equipment.

Findings*

The average and marginal costs of conservation depend on differences in management protocols (e.g. whether or not the accession is initially regenerated), the holding period (whether seed is stored for one more year or in perpetuity), the type of accession (whether a new accession is introduced or an existing accession is rolled over), and the capacity of the storage facility. The collection presently stored in the CIMMYT genebank occupies one-third of the facility’s total capacity. Thus the current average costs per accession for wheat (US$1.84) and maize (US$13.59) are roughly three times the estimated costs at full capacity (US$0.58 and US$3.45, respectively), assuming no regeneration is required. New introductions undergo seed health checks, the costs of which are presently being calculated.

The cost of storage per se represents only a fraction of the overall costs of conserving the collections; the costs incurred in regenerating accessions are a major additional expense. Regeneration is considerably more costly for maize (US$123.59 per accession) than for wheat (US$2.04). This reflects the more costly methods required to limit genetic drift in the highly heterogeneous and outpollinating maize accessions, as well as differences in the growth habits of the two crops. Depending on the protocol for a newly introduced accession, the average cost of incorporating an accession into the genebank varies markedly. The average cost of introducing a new wheat accession is US$2.06 per accession without initial regeneration, and US$4.24 with regeneration. Comparable figures for maize are US$16.69 and US$140.50, respectively. (It should be noted that these are lower-bound cost estimates; accounting for the costs incurred in checking the health of the seeds will increase these figures.) As the CIMMYT genebank is operating well below capacity these average costs provide an upper-bound estimate of the corresponding marginal costs.

* The figures presented here are close to, but not final, estimates. Some data elements are being rechecked and the costs of seed health activities are yet to be finalized. Nonetheless it is anticipated that there will be little change to the main findings, although some of the important detail may vary.
cost (i.e. the cost of adding one more accession to the collection).

The figures above refer to the costs of conserving an accession for one more year with the notion that decisions taken now can be revisited the following year. However, the costs of conserving accessions in perpetuity are also relevant, especially for the CGIAR holdings that are held in trust for future generations. The cost of such a guarantee obviously depends on the state of future technology, input costs (including interest rates), storage capacity and regeneration intervals. In present value terms, the lower-bound average cost of conserving an accession for perpetuity is in the range of US$25 to US$75 for wheat and US$230 to US$500 for maize. The large spread in these estimates reflects the importance of assumed differences in the regeneration interval and the discount rate. The comparatively large cost involved in storing maize in perpetuity suggests that conservation priorities should be set to determine what types of genetic resources ought to be added to or retained in the collection. Perhaps, for example, there is greater value in conserving new accessions of landraces and wild relatives rather than recently created breeding lines.

**Next steps**
The methodology for costing seed genebank operations will be further refined. Additional work is required on the comparative costs of field-in-vitro and seed banks and of maintaining different species in different locations, under different institutional arrangements. Comparative economic analyses of ex situ conservation can help inform decision-making on the implementation of appropriate conservation strategies and the rational management of genebank collections. This was emphasized in the Global Plan of Action for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture.
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(CIFOR)

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(ICRAF)

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(ICRISAT)

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2 From 15 June 1998.

Reports

Report of the Eighth Meeting of the Inter-Centre Working Group on Genetic Resources, held at the International Centre for Research in Agroforestry (ICRAF), Nairobi, Kenya, 7-13 January 1998.

Annex to the Report of the Eighth Meeting of the Inter-Centre Working Group on Genetic Resources, held at the International Centre for Research in Agroforestry (ICRAF), Nairobi, Kenya, 7-13 January 1998

Report of the SINGER Planning and Consultation Meetings, held at the Food and Agriculture Organization of the United Nations (FAO) and at the International Plant Genetic Resources Institute, Rome, Italy, 9-14 November 1998

Publications

This report presents income and expenditures for coordination and collaborative activities within SGRP for the period 1 January 1998 through to 31 December 1998.

### 1998 FUNDING

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### 1998 EXPENDITURES/COMMITMENTS

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<td>ICWG-GR</td>
<td>Inter-Cente Working Group on Genetic Resources</td>
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<tr>
<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<tr>
<td>IITA</td>
<td>International Institute of Tropical Agriculture</td>
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<td>ILRI</td>
<td>International Livestock Research Institute</td>
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<tr>
<td>INIBAP</td>
<td>International Network for the Improvement of Banana and Plantain</td>
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<td>IPRGRI</td>
<td>International Plant Genetic Resources Institute</td>
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<tr>
<td>IPR</td>
<td>Intellectual Property Rights</td>
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<tr>
<td>IRAD</td>
<td>Institut de la recherche agricole pour le développement</td>
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<tr>
<td>IRRI</td>
<td>International Rice Research Institute</td>
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<tr>
<td>ISNAR</td>
<td>International Service for National Agricultural Research</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>IUCN</td>
<td>International Union for Conservation of Nature</td>
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<tr>
<td>IUFRO</td>
<td>International Union of Forestry Research Organizations</td>
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<tr>
<td>IWIS</td>
<td>International Wheat Information System</td>
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<tr>
<td>IWMII</td>
<td>International Water Management Institute</td>
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<tr>
<td>JIRCAS</td>
<td>Japan International Research Center for Agricultural Sciences</td>
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<tr>
<td>MTA</td>
<td>Material Transfer Agreement</td>
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<tr>
<td>NARS</td>
<td>National Agricultural Research Systems</td>
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<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
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<tr>
<td>PGRFA</td>
<td>Plant Genetic Resources for Food and Agriculture</td>
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<tr>
<td>SAFORGEN</td>
<td>Regional network of forest genetic resources in Sub-Saharan Africa</td>
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<tr>
<td>SGRP</td>
<td>CGIAR System-wide Genetic Resources Programme</td>
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<tr>
<td>SINGER</td>
<td>CGIAR System-wide Information Network for Genetic Resources</td>
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<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
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<tr>
<td>WANA</td>
<td>West Asia and North Africa</td>
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<tr>
<td>WARDA</td>
<td>West Africa Rice Development Association</td>
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<tr>
<td>WIEWS</td>
<td>World Information and Early Warning System</td>
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<tr>
<td>WWW</td>
<td>World Wide Web</td>
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<tr>
<td><strong>CENTRE</strong></td>
<td><strong>ADDRESSES</strong></td>
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<td><strong>CIAT</strong></td>
<td>Centro Internacional de Agricultura Tropical  &lt;br&gt; Apartado Aéreo 6713  &lt;br&gt; Cali  &lt;br&gt; Colombia  &lt;br&gt; E-mail: <a href="mailto:ciat@cgiar.org">ciat@cgiar.org</a></td>
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<tr>
<td><strong>CIFOR</strong></td>
<td>Center for International Forestry Research  &lt;br&gt; Jalan CIFOR  &lt;br&gt; Situ Gede, Sindangbarang  &lt;br&gt; Bogor Barat 16680  &lt;br&gt; Indonesia  &lt;br&gt; E-mail: <a href="mailto:cifor@cgiar.org">cifor@cgiar.org</a></td>
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<td><strong>CIMMYT</strong></td>
<td>Centro Internacional de Mejoramiento de Maíz y Trigo  &lt;br&gt; Lisboa 27  &lt;br&gt; Apartado Postal 6-641  &lt;br&gt; 06600 Mexico, DF  &lt;br&gt; Mexico  &lt;br&gt; E-mail: <a href="mailto:cimmyt@cgiar.org">cimmyt@cgiar.org</a></td>
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<tr>
<td><strong>CIP</strong></td>
<td>Centro Internacional de la Papa  &lt;br&gt; Apartado 1558  &lt;br&gt; Lima 12  &lt;br&gt; Peru  &lt;br&gt; E-mail: <a href="mailto:cip@cgiar.org">cip@cgiar.org</a></td>
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<td><strong>ICARDA</strong></td>
<td>International Center for Agricultural Research in the Dry Areas  &lt;br&gt; PO Box 5466  &lt;br&gt; Aleppo  &lt;br&gt; Syrian Arab Republic  &lt;br&gt; E-mail: <a href="mailto:icada@cgiar.org">icada@cgiar.org</a></td>
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<td><strong>ICLARM</strong></td>
<td>International Center for Living Aquatic Resources Management  &lt;br&gt; MC PO Box 2631  &lt;br&gt; Makati Central Post Office  &lt;br&gt; 0718 Makati City  &lt;br&gt; Philippines  &lt;br&gt; E-mail: <a href="mailto:iclam@cgiar.org">iclam@cgiar.org</a></td>
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<td><strong>ICRAF</strong></td>
<td>International Centre for Research in Agroforestry  &lt;br&gt; United Nations Avenue  &lt;br&gt; PO Box 30677  &lt;br&gt; Nairobi  &lt;br&gt; Kenya  &lt;br&gt; E-mail: <a href="mailto:icraf@cgiar.org">icraf@cgiar.org</a></td>
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<td><strong>ICRISAT</strong></td>
<td>International Crops Research Institute for the Semi-Arid Tropics  &lt;br&gt; Patancheru 502 324  &lt;br&gt; Andhra Pradesh  &lt;br&gt; India  &lt;br&gt; E-mail: <a href="mailto:icrisat@cgiar.org">icrisat@cgiar.org</a></td>
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<td><strong>IFPRI</strong></td>
<td>International Food Policy Research Institute  &lt;br&gt; 2033 K Street NW  &lt;br&gt; Washington, DC 20006  &lt;br&gt; USA  &lt;br&gt; E-mail: <a href="mailto:ifpri@cgiar.org">ifpri@cgiar.org</a></td>
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<td><strong>IITA</strong></td>
<td>International Institute of Tropical Agriculture  &lt;br&gt; PMB 5320  &lt;br&gt; Ibadan  &lt;br&gt; Nigeria  &lt;br&gt; E-mail: <a href="mailto:iita@cgiar.org">iita@cgiar.org</a></td>
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<td><strong>ILRI</strong></td>
<td>International Livestock Research Institute  &lt;br&gt; PO Box 30709  &lt;br&gt; Nairobi  &lt;br&gt; Kenya  &lt;br&gt; E-mail: <a href="mailto:ilri@cgiar.org">ilri@cgiar.org</a></td>
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<td><strong>IPGRI</strong></td>
<td>International Plant Genetic Resources Institute  &lt;br&gt; Via delle Sette Chiese 142  &lt;br&gt; 00145 Rome  &lt;br&gt; Italy  &lt;br&gt; E-mail: <a href="mailto:ipgri@cgiar.org">ipgri@cgiar.org</a></td>
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<td><strong>IRRI</strong></td>
<td>International Rice Research Institute  &lt;br&gt; MC PO Box 3127  &lt;br&gt; 1271 Makati City  &lt;br&gt; Philippines  &lt;br&gt; E-mail: <a href="mailto:iri@cgiar.org">iri@cgiar.org</a></td>
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<td><strong>ISNAR</strong></td>
<td>International Service for National Agricultural Research  &lt;br&gt; Laan van Nieuw Oost Indië 2593 BM The Hague  &lt;br&gt; The Netherlands  &lt;br&gt; E-mail: <a href="mailto:isnar@cgiar.org">isnar@cgiar.org</a></td>
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<td><strong>IWMI</strong></td>
<td>International Water Management Institute  &lt;br&gt; PO Box 2075  &lt;br&gt; Colombo  &lt;br&gt; Sri Lanka  &lt;br&gt; E-mail: <a href="mailto:iwmi@cgiar.org">iwmi@cgiar.org</a></td>
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<td><strong>WARDA</strong></td>
<td>West Africa Rice Development Association  &lt;br&gt; 01 BP 2551  &lt;br&gt; Bouaké 01  &lt;br&gt; Côte d’Ivoire  &lt;br&gt; E-mail: <a href="mailto:wada@cgiar.org">wada@cgiar.org</a></td>
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