Chapter 6

The state of regional and international collaboration

6.1 Introduction

The previous chapter of this report described the current status of national programmes and trends that have occurred since the first SoW report was published. This chapter will describe and attempt to analyse developments at the international level.

Overall there has been a dramatic increase in international activities since 1996, in all fields related to the conservation and use of PGRFA. Many new regional and crop-specific networks and programmes have been set up, at least in part in response to the priorities for action contained in the GPA. The CBD and the ITPGRFA have both served to give prominence to the need for greater international collaboration. Many programmes set up to promote various aspects of the Convention or Treaty, involve collaboration among multiple partners. For example, the creation of the MLS for ABS under the ITPGRFA has greatly strengthened awareness of needs and opportunities in this area and although it is not yet possible to assess its impact quantitatively, there are signs that cooperation is expanding with respect to germplasm exchange.

Section 1.4 describes the extent of interdependence among all nations with respect to PGRFA. Such interdependence, arising from the spread of crops around the globe from their centres of origin, makes international cooperation not just desirable but essential if the full value of PGRFA is to be realized. Awareness among policy-makers and the general public of the importance of PGRFA and the extent of interdependence has grown considerably in recent years, at least in part because of high-profile initiatives such as the establishment and opening of the SGSV.

Given the very large number of regional and international networks, programmes, institutions and other cooperative initiatives involving PGRFA that are now in existence, it is not possible to mention them all and this chapter does not attempt to provide a comprehensive coverage. Indeed, given the huge diversity in types of collaborative arrangements, it is even difficult to classify them into any consistent and useful typology. This chapter thus presents major developments that have occurred since the first SoW report was published, with respect to multicrop associations and networks, crop-specific networks, thematic networks, regional and international organizations and programmes, bilateral programmes, international and regional agreements and funding mechanisms. While an attempt has been made throughout the chapter to assess the extent of progress since 1996, this is made difficult by the fact that the information in the first SoW report is all of a qualitative nature and it has not been possible to get any quantitative data on the current status of regional and international cooperation or on trends over recent years. The chapter concludes with a review of major changes that have occurred since 1996 and lists some ongoing gaps and needs for the future.

6.2 PGRFA networks

A very large number of networks currently address one or more aspects of PGRFA. Many of these have come into existence since the first SoW report was published. While all aim to promote and support collaboration among partners for a common purpose, there is a huge diversity in their objectives, size, focus, geographic coverage, membership, structure, organization, governance, funding, etc. For ease of reference, the term 'network' will generally be used to describe such collaborative arrangements, irrespective of whether they are formally called a network, or have adopted a different title such as association, alliance, cooperative, consortium or coalition.

Networks are very important for promoting co-operation, sharing knowledge, information and ideas, exchanging germplasm and for carrying out joint research and other activities. They support the sharing of expertise and help compensate or provide backstopping in cases where certain network participants lack the critical mass to carry out particular activities. They enable synergies to be captured when different partners have different and complementary skills and capacities. Collaboration is also critical to gaining maximum benefits under legal and policy instruments such as the CBD, GPA and ITPGRFA and to meeting associated obligations.

Networks in the PGRFA field generally fall into one of three broad categories:

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a) those that focus on conservation, often regional and multicrop in nature;
b) those that focus on one of a few specific crops and may be either regional or global in scope. The primary objective of many such networks is to facilitate crop improvement;
c) those that address a particular topic or theme relating to PGRFA, across crops, such as seed systems, genomics, taxonomy, or *in situ* conservation.

Overall, good progress has been made since the first SoW report was published in all three groups of networks. The following sections do not attempt to provide comprehensive coverage or description of all relevant networks, but rather, give a snapshot of some of the more significant changes that have occurred since 1996.

6.2.1 Regional multicrop PGRFA networks

Since 1996, the number of regional and subregional PGRFA networks has grown so that all countries in all areas of the world are now eligible to join one or more of them. They bring together the heads of national genetic resources programmes, genebank managers and others concerned with conservation and in many cases also include various users of PGRFA, such as plant breeders, NGOs and the private sector. In many cases, these networks are linked to the regional fora, which in turn are key participants in the GFAR, described later. Table 6.1 lists the main PGRFA networks that fall into this category. Some of the major developments that have taken place over recent years in these networks, as well as a few other regional multicrop networks, are described for each region. Overall, the networks have tended to be most active in the areas of training and documentation and have taken on a leadership role in the development of regional PGRFA conservation strategies, under an initiative of the GCDT.

Africa

Networking in PGRFA has expanded considerably in Africa since the publication of the first SoW report. FARA[1] was created in 2002 as an umbrella organization bringing together and supporting the three African subregional associations concerned with agricultural research for development: the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and the SADC, Food, Agriculture and Natural Resources Directorate (FANR). These three entities provide the umbrella for the three main PGRFA networks in Sub-Sahara Africa: EAPGREN, the Genetic Resources Network for West and Central Africa (GRENEWECA) and SADC, Plant Genetic Resources Network (PGRN):

- the East African Plant Genetic Resources Network (EAPGREN):[2] EAPGREN, hosted by ASARECA, became operational in 2003 with a membership comprising ten countries.[3] The Nordic Genebank (NGB) and Bioversity International provide technical backstopping. It has undertaken a wide range of activities in Eastern Africa including the exchange of information, training, awareness raising and policy advocacy. An information and documentation centre is currently being set up and greater collaboration among genebanks, farmers and other end-users is being promoted. A regional strategy for PGR has been developed under the GCDT initiative and key *ex situ* collections have been identified that require urgent regeneration as mentioned in the Ethiopia, Kenya and Uganda country reports;
- GRENEWECA: This network was established in 1998 under the CORAF/WECARD.[4] Various meetings have been held e.g. in Ibadan, Nigeria in 2004 and in Ouagadougou, Burkina Faso, in 2006 to discuss regional strategies. Funding support has come from Bioversity International and GCDT mainly but overall, GRENEWECA has not had the same level of external funding support as the other African regional PGRFA networks. The establishment of four nodal centres of excellence has been proposed as a means of strengthening PGR activities at the subregional level;
- SADC Plant Genetic Resources Network (SADC-PGRN):[5] Although established in 1989, the SADC-

TABLE 6.1
Regional multicrop plant genetic resources networks around the world

Region	Subregions included (all or part)	Network title (acronym)	Umbrella regional research association or forum	Institution responsible for coordination
Africa	East Africa, Madagascar	The East African Plant Genetic Resources Network (EAPGREN)	ASARECA	ASARECA
Africa	West Africa, Central Africa	Genetic Resources Network for West and Central Africa (GRENEWECA)	CORAF/WECARD	Bioversity International
Africa	Southern Africa, Madagascar, Mauritius	SADC Plant Genetic Resources Network (SADC-PGRN)	SADC	SPGRC
Americas	South America	The Andean Network on Plant Genetic Resources (REDARFIT)	PROCIANDINO	INIA-Peru (2009)
Americas	Central America	Mesoamerican Network on Plant Genetic Resources (REMERFI)	SICTA	SICTA
Americas	Caribbean	The Caribbean Plant Genetic Resources Network (CAPGERNET)	PROCICARIBE	CARDI
Americas	North America	The Plant Genetic Resources Network for North America (NORGEN)	PROCINORTE	IICA
Americas	South America	The Plant Genetic Resources Network for the Southern Cone (REGENSUR)	PROCISUR	INIA-Uruguay (2009)
Americas	South America	The Amazonian Network for Plant Genetic Resources (TROPIGEN)	PROCITROPICOS	PROCITROPICOS
Asia and the Pacific	East Asia	Regional Network for Conservation and Use of Plant Genetic Resources in East Asia (EA-PGR)	APAARI	Bioversity International
Asia and the Pacific	Pacific	The Pacific Agricultural Plant Genetic Resources Network (PAPGREN)	SPC	SPC
Asia and the Pacific	South Asia	South Asia Network on Plant Genetic Resources (SANPGR)	APAARI	Bioversity International
Asia and the Pacific	Southeast Asia	Regional Cooperation in South East Asia for PGR (RECSEA-PGR)	APAARI	Bioversity International
Europe	Europe	European Cooperative Programme for Genetic Resources (ECPGR)		Bioversity International
Europe	Nordic region	The Nordic Genetic Resources Centre (NordGen)	Nordic Council of Ministers	NordGen
Europe	Southeast Europe	South East European Development Network on Plant Genetic Resources (SeedNet)		Swedish Biodiversity Centre
Near East	Central Asia and Caucasus	The Central Asian and Caucasus Network on Plant Genetic Resources (CACN-PGR)	CACAARI	Bioversity International
Near East	West Asia and Southeast Asia	West Asia and North Africa Genetic Resources Network (WANANET)*	AARINENA	ICARDA

*Now defunct, a new PGRFA network is being established by AARINENA

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PGRN has continued to grow since the publication of the first SoW report. Its membership has risen to 14 countries and the SADC SPGRC, which now comes under the responsibility of SADC-FANR, provides coordination. Major activities over the past decade have included the further development of the central base collection, capacity building in member countries and the development of a documentation and information system on the *ex situ* holdings of member countries. It has also established several working groups, and a regional conservation strategy, developed under the GCDT initiative, has been published.

Americas

The Inter-American Institute for Cooperation on Agriculture (IICA) has established a system of subregional networks to promote collaboration in agricultural research and technology development throughout the Americas. Currently these are: Programa Cooperativa de Innovación Tecnológica Agropecuaria para la Región Andina (PROCIANDINO) (Andes), Agricultural Science and Technology Networking System (PROCICARIBE) (Caribbean), Cooperative Program in Agricultural Research and Technology (PROCINORTE) (North America), Cooperative Programme for the Technological Development of the Agrofood and Agro-industry in the Southern Cone (PROCISUR), Programma Cooperativo de Investigación y Transferencia de Tecnología para los Trópicos Suramericans (PROCITROPICOS) and the Sistema de Integracion Centroamericana de Tecnologia Agricola (SICTA). They provide an umbrella for the six subregional networks on PGRFA described below and listed in Table 6.1: REDARFIT, CAPGERNET, NORGEN, Plant Genetic Resources Network for the Southern Cone (REGENSUR), TOPIGEN and Mesoamerican Network on Plant Genetic Resources (REMERFI) respectively. While many of these PGRFA networks were established prior to the publication of the first SoW report, recent years have seen relatively little major progress due to resource constraints as pointed out in the Costa Rica country report. However, new networks were established for the Caribbean (CAPGERNET) in 1998 and for North America (NORGEN) in 1999. An important development at the regional level has been the creation of the Regional Forum for Agricultural Research and Technology Development (FORAGRO):[6] Established in 1997, FORAGRO has a secretariat housed at IICA in Costa Rica. It serves all countries of the Americas and seeks to promote dialogue and cooperation in agricultural research. Its membership includes the PROCIs as well as representatives from NARS, NGOs, the private sector and others. PGRFA is an important thematic area of FORAGRO, which played a lead role in developing the PGRFA conservation strategy for the Americas under the GCDT initiative.

- the Caribbean Plant Genetic Resources Network (CAPGERNET): Established in 1998, CAPGERNET consists of 28 Caribbean countries and receives technical support from the Caribbean Agricultural Research and Development Institute (CARDI), IICA, Centre technique de coopération agricole et rurale (CTA) and Bioversity International. Activities have included capacity building, preparing PGRFA inventories, developing an information system and germplasm exchange. It held a workshop in May 2007 in Trinidad and Tobago as an input to the regional PGRFA conservation strategy. It is also coordinating the regeneration of collections of beans in Cuba, cassava in Guyana, yams in Guadeloupe and sweet potato in Trinidad and Tobago;
- the Plant Genetic Resources Network for North America (NORGEN): Operating under the aegis of PROCINORTE, Canada, Mexico and the United States of America are focusing collectively through NORGEN on information exchange, training, collecting bean wild relatives in Mexico and implementing research projects in collaboration with other networks. NORGEN has provided support to several developing countries to enable scientists and technicians to participate in meetings and training courses in North America; the Andean Network on Plant Genetic Resources (REDARFIT):[7] The Andean network involves five countries[8] and operates under the aegis of PROCIANDINO. Major activities carried out since the first SoW report was published have included (i) workshops on PGRFA management; (ii) training courses on cherimoya, GIS and characterization, risk management and

germplasm enhancement; (iii) a symposium on genetic resources in the Americas; (iv) collaborative research projects on tree tomatoes, cherimoya, native potatoes and *Lycopersicon* spp.; and (v) a programme on germplasm regeneration;

- the Plant Genetic Resources Network for the Southern Cone (REGENSUR): This network, comprising six countries,[9] is a network of PROCISUR that seeks to strengthen the work of the national programmes in the Southern Cone. Over the last decade, its activities have included: (i) training on germplasm enhancement, documentation, genebank management, *in situ* conservation and seed-pathology; (ii) hosting a workshop to develop the regional PGRFA conservation strategy for the Americas; and (iii) carrying out collaborative research on maize, wheat and vegetables.
- the Mesoamerican Network on Plant Genetic Resources (REMERFI); This network of eight countries[10] in Central America has been relatively inactive since 1996 although activities carried out in recent years have included: (i) training and capacity building on documentation; (ii) research projects on seeds; (iii) genetic resources of *Annonaceae* and *Sapotaceae*; and (iv) the conservation and use of native neo-tropical crops and their wild relatives;
- the Amazonian Network for Plant Genetic Resources (TROPIGEN): Operating under PROCITROPICOS, this network has eight member countries.[11] Activities since 1996 have included: characterization of underexploited vegetable and fruit crops; germplasm evaluation; identifying gaps in collections; prioritizing species for PGR research and management; developing a policy framework for access and benefit-sharing; information exchange and strengthening links between genebanks and breeding programmes. It has a major focus on capacity building.

Asia and the Pacific

Almost all of the subregional networks in the Asia and the Pacific region concerned with PGRFA have been initiated and/or are being facilitated by Bioversity International, in collaboration with FAO and the main regional association for agricultural research, the Asia-Pacific Association of Agricultural Research Institutions (APAARI).[12] The latter has also been active in its own right in supporting activities on PGRFA and published a regional report on PGR-related activities in 2000, provided a neutral platform for discussion of policy related issues and endorsed the regional PGRFA conservation strategy for Asia under the GCDT initiative.

Although most of the subregional PGRFA networks were established prior to the publication of the first SoW report, some, particularly the South Asia Network on Plant Genetic Resources (SANPGR), have made very substantial progress in recent years and a new network has been established for the Pacific.

- the Regional Network for Conservation and Use of Plant Genetic Resources in East Asia (EA-PGR):[13] EA-PGR promotes collaboration among its five member countries[14] in collecting, conservation, exchange, documentation/information and training. Major accomplishments since the first SoW report was published have included: (i) establishing the CAAS China-Bioversity Centre of Excellence for training on *in vitro* conservation, cryopreservation and molecular characterization; (ii) developing a subregional strategy as part of the overall South, Southeast and East Asia (SSEEA) regional conservation strategy; (iii) joint collecting, characterization and evaluation of millets in the Democratic People's Republic of Korea and Mongolia; (iv) joint studies on genetic diversity of adzuki bean, Job's tears and perilla in China, Japan and the Republic of Korea; and (v) establishing a network web site;
- the Pacific Agricultural Plant Genetic Resources Network (PAPGREN):[15] Established in 2001, PAPGREN comprises 13 nations[16] and is coordinated by the Land Resources Division of the SPC, Suva, Fiji in collaboration with Bioversity International. In addition to convening a number of key meetings and workshops, major accomplishments have included: (i) developing a directory of PGR collections; (ii) drawing up a regional conservation strategy; (iii) providing advice on policy issues; (iv) supporting emergency collecting and characterization; (v) public awareness activities; and (vi) developing a web site and blog;

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- the Regional Cooperation in South East Asia for PGR (RECSEA-PGR):[17] Established in 1993, RECSEA-PGR remained active in the period following the publication of the first SoW report, although activities have tended to be somewhat curtailed in recent years due to a lack of funding as Malaysia and Thailand indicate in their country report. The network, which comprises seven member countries,[18] aims to build and enhance national research capacity in Southeast Asia through collaboration in areas such as policy, database development and sharing information and expertise. RECSEA-PGR's major recent accomplishments have included inputs to the SSEEA regional conservation strategy under the GCDT initiative and the setting up of a PGR Policy Forum together with APAARI, aimed at drafting an SMTA applicable to all materials of common interest that are not included within Annex 1 of the ITPGRFA;
- SANPGR:[19] Accomplishments of this six-country[20] network over the past decade have included: (i) training on seed genebank management, GMS software and the genetic resources of tropical fruits; (ii) establishing a regional Centre of Excellence for training on *in vitro* conservation and cryopreservation at NBPGR, India; (iii) promoting post-graduate courses on PGR in India and Sri Lanka; (iv) establishing a web site; (v) developing the South Asia component of the SSEEA regional PGRFA conservation strategy; and (vi) the joint evaluation of finger millet in Bangladesh, Bhutan, India and Nepal. Several meetings have been held and the proceedings published. A Steering Committee was constituted in 2002 to oversee network activities and the implementation of action plans.

Europe

Collaboration among European PGR programmes has further strengthened since the publication of the first SoW report, as a result of increased support from many individual countries as well as from the European Union. Bioversity International has continued to host the secretariats of the ECPGR, the main network on PGRFA in Europe, as well as the European Forest Genetic Resources Network (EUFORGEN). In addition to ECPGR, the Nordic countries have a collaborative programme on genetic resources (NordGen) that includes a common genebank and a new networking programme on PGRFA was established in 2004 in Southeastern Europe.

- ECPGR:[21] ECPGR is a joint programme of about forty European countries[22] that aims to facilitate the conservation and use of PGRFA in Europe and strengthen links between Europe and elsewhere in the world. It is structured into nine networks (six crop networks and three thematic networks) and implements activities through working groups and task forces. ECPGR collaborates with regional programmes such as the European System of Cooperative Research Networks on Agriculture (ESCORENA). ECPGR members are currently setting up AEGIS,[23] a programme that aims to rationalize collections (see Section 7.3.3.2) as well as EURISCO,[24] a globally accessible catalogue, launched in 2003, that contains information on more than 1.1 million accessions;
- NordGen:[25] NordGen is an institution under the Nordic Council of Ministers.[26] It was established in 2008 through a merger of the Nordic Gene Bank, the Nordic Gene Bank for Farm Animals and the Nordic Council for Forest Reproductive Material;
- the South East European Development Network on Plant Genetic Resources (SeedNet): This network which was set up in 2004 operates in Southeast European countries and aims to promote the long-term conservation and use of PGR through creation of national programmes and gene bank facilities. The core of the network consists of a number of crop-specific and thematic working groups.

Near East

The Near East region, which includes Central Asia, the Caucasus, West Asia and North Africa (WANA), has seen both good progress and also some stagnation in the period since the first SoW report was published. In Central Asia and the Caucasus, the regional PGRFA network CACN-PGR has been brought under

the auspices of the Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI),[27] which was established in 2004.

- the Central Asian and Caucasian Network on Plant Genetic Resources (CACN-PGR):[28] This network, established in 1999, involves eight countries[29] and has nine crop working groups. It is backstopped jointly by ICARDA and Bioversity International. A regional database has been set up that includes passport data for almost 120 000 accessions and a regional PGR strategy has been developed with support from the GCDT;
- the West Asia and North Africa Genetic Resources Network (WANANET): WANANET was originally set up as a regional network to help strengthen PGRFA activities in WANA. Unfortunately, due to lack of resources it is currently defunct. A regional strategy for the conservation of PGRFA was developed in 2006 under the GCDT initiative, with technical support from ICARDA and Bioversity International, that highlighted the importance of networking in the region. The Association of Agricultural Research Institution in the Near East and North Africa (AARINENA)[30] has established a new network on PGR in 2008.

6.2.2 Crop-specific networks

There is a vast range of international crop-specific networks operating regionally or globally. Most have some aspect of crop improvement as their primary focus, although they may also involve the conservation of PGRFA. They range from relatively straightforward mechanisms for distributing breeding materials, multilocation testing and the sharing of information and results, to fully collaborative research networks in which the comparative advantages of the participating institutions are brought to bear on a common problem or issue. Many of the networks that have international germplasm distribution and collaborative testing as their primary focus are coordinated by the IARCs and some of these are mentioned in the section on international organizations below. A few examples are given here of new, crop-specific networks that have come into existence or have developed significantly since the first SoW report was published.

The International Network for Bamboo and Rattan (INBAR)[31] was established in 1997 to promote the improved production, processing and trade of bamboo and rattan. INBAR facilitates a global network of partners from the government, private and non-profit sectors in over 50 countries. The conservation and sustainable use of bamboo and rattan genetic resources are an important part of INBAR's programme.

In 2006, the CacaoNet[32] was launched as a network of institutions that collaborate in the conservation and use of cacao genetic resources. Its membership includes a wide range of international and regional public institutions as well as the Biscuit, Cake, Chocolate and Confectionery Association (BCCCA), the Cocoa Producers Alliance (COPAL), the International Cocoa Organization (ICCO), the International Group for the Genetic Improvement of Cocoa (INGENIC) and the World Cocoa Foundation (WCF).

The INIBAP established a number of regional networks on banana and plantain in the late 1980s and early 1990s. Since the first SoW report was published, a number of important changes have taken place. The Réseau Musa pour l'Afrique Centrale et Occidentale (MUSACO) was founded in 1997 at the invitation of the CORAF/WECARD and the Banana Research Network for Eastern and Southern Africa (BARNESA) became a network under the auspices of ASARECA. The Latin America and Caribbean Network (LACNET) was renamed the Plantain and Banana Research and Development Network for Latin America and the Caribbean (MUSALAC)[33] in 2000 and now operates under FORAGRO. Likewise, the INIBAP Asia-Pacific Network (ASPNET) was renamed the Banana Asia Pacific Network (BAPNET)[34] in 2002 and now operates under the auspices of APAARI. INIBAP itself was formally incorporated, together with the International Plant Genetic Resources Institute (IPGRI), within Bioversity International in 2006.

Within the Americas, the Latin American/Caribbean Consortium on Cassava Research and Development (CLAYUCA)[35] was established in 1999 as a regional mechanism to facilitate cassava research and development through the participation of stakeholders from both the private and public sectors. Located on CIAT's campus in Colombia, CLAYUCA is also building links between Latin America and the Caribbean

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and African countries for technology development, training, germplasm distribution and the dissemination of information.

Within the Near East, AARINENA has sponsored various crop-specific initiatives on PGRFA since 1996, including convening networks on date palm, olive and medicinal plants. The Interregional Network on Cotton in Asia and North Africa (INCANA) was established in 2002 with support from GFAR, AARINENA, APAARI, CACAARI, ICARDA and the Agricultural Research and Education Organization (AREO), the Islamic Republic of Iran.

In addition, several new crop networks have been established at the global level that aim to generate and share genomic information on particular crops or groups of crops. These include, for example, the International Coffee Genome Network (ICGN)[37] and the collaborative international Rice Genome Sequencing Project.

6.2.3 Thematic networks

As indicated above, many new thematic networks have been established in recent years that carry out cooperative activities relating to PGRFA. Again, these are far too numerous to cover in detail and just a few examples are presented here of networks that are either new or have undergone significant change since 1996.

Since 2001, three new networks have been established specifically to promote and support the development of the seed sector in Africa: the Africa Seed Network (ASN),[38] the SADC Seed Security Network (SSSN)[39] and the West Africa Seed Network (WASNET). In 2001, the New Partnership for Africa's Development (NEPAD) was created which, among other initiatives, promoted the establishment of four biosciences networks: Biosciences East and Central Africa (BECA), the West Africa Biosciences Network (WABNET), the South African Network for Biosciences (SANBio), as well as the North Africa Biosciences Network (NABNET). SANBio, as mentioned in the Zimbabwe country report, has been particularly active in the area of PGRFA, having devoted attention to creating facilities for conserving vegetatively propagated crops, molecular characterization and promoting regional collaboration.

Within the Americas, new thematic networks established since 1996 include: the Network on Plant Biotechnology in Latin American and the Caribbean (REDBIO) which promotes the use of biotechnology for crop improvement and genetic conservation and the Agricultural Innovation Network (RedSICTA), a networking project of IICA in cooperation with the Swiss Agency for Development and Cooperation (SDC). A key aim of RedSICTA is to improve seed production in Latin America and the Caribbean as illustrated in the Nicaragua country report.

NGOs have also played a greater role over the last ten years in networking. The Community Biodiversity Development Conservation (CBDC)[40] programme, for example, which involves a number of countries in Africa, Latin America and Asia, is spearheaded by several local and international NGOs. CBDC brings governmental institutions and NGOs together at the global, regional and national level and has major focus on the conservation, use, marketing and where necessary, restoration of traditional germplasm resources.

6.3 International organizations and associations with programmes on PGRFA

There is a large range of international and regional associations that, while not exclusively focused on PGRFA, nevertheless have significant programmes that involve PGR. Arguably, the two largest and most important of these are FAO and the CGIAR and developments in each of these are given in the following sections. This is followed by a brief consideration of developments that have taken place since the first SoW report in other international and regional organizations, in international fora and associations, in bilateral arrangements and within the NGO community.

6.3.1 FAO's initiatives on PGRFA

FAO has remained very active in promoting and supporting activities on PGRFA since the first SoW report was published and it has made significant progress in a number of key areas. It provides

administrative, scientific and technical support to the work of both the secretariat of the CGRFA and the secretariat of the ITPGRFA.

The CGRFA, established as an intergovernmental forum in 1983, has overseen the creation and development of the Global System for the Conservation and Sustainable Use of PGR. This system, managed and coordinated by FAO, aims to ensure the safe conservation and promote the availability and sustainable use of PGR. The first SoW report described the major elements of the system and only the most significant developments are reported below. The GPA provides the overall framework or blueprint for the Global System and the periodic SoW reports provide a mechanism for monitoring progress and evaluating the system. The basic agreement and intergovernmental policy instrument that underpinned the development of the Global System was, until 2004, the International Undertaking on Plant Genetic Resources for Food and Agriculture. This was superseded when the ITPGRFA came into force. The ITPGRFA is covered in considerable detail in Section 7.2.1 and is only mentioned briefly below:

- CGRFA:[41] It is a forum for governments to discuss and negotiate matters relevant to genetic resources for food and agriculture. It reviews and advises FAO on policy matters, programmes and activities. Currently, 168 states and the European Union are members of the CGRFA, which is the only intergovernmental body that specifically deals with all components of biological diversity for food and agriculture. The CGRFA started out as the Commission on Plant Genetic Resources and only in 1995 took on responsibility for other components of agricultural biodiversity. In 1997, recognizing the separate needs of the different components, the CGRFA established two international technical working groups, one on PGR and the other on animal genetic resources. The CGRFA provided the forum for the successful negotiation of the ITPGRFA, a legally-binding international agreement that came into force in June 2004 (see Section 7.2.1). The CGRFA acted as the Interim Committee for the ITPGRFA until 2006, when its own Governing Body was established. The CGRFA also developed the first GPA and is responsible for monitoring its implementation. At its Eleventh Regular Session in June 2007, the CGRFA adopted a rolling ten-year programme of work, which foresees the publication of the first report on the SoW's Biodiversity for Food and Agriculture and the integration of the ecosystem approach into biodiversity management in agriculture, forestry and fisheries;
- International Network of *Ex Situ* Collections: As described in the first SoW report, in 1994, eleven IARCs of the CGIAR signed agreements with FAO, acting for the CGRFA, bringing their *ex situ* germplasm collections within the International Network of *Ex Situ* Collections. These agreements and indeed the International Network as a whole, were superseded in 2006 when the centres signed further agreements with FAO, this time acting on behalf of the Governing Body of the ITPGRFA. The new agreements bring all the *ex situ* collections of PGRFA held by the centres (approximately 650 000 accessions of the world's most important crops) within the MLS of ABS of the ITPGRFA;
- GIPB:[42] launched in 2006, GIPB is an initiative whose primary aim is to strengthen and support the capacity of developing countries to conduct and benefit from plant breeding. It is a partnership that involves many agricultural research, education and development institutions. Further information on GIPB can be found in Sections 4.4 and 7.3.2;
- Agreement with the CBD: one area in which significant progress has been made is in the strengthening of the relationship with the CBD. A Memorandum of Cooperation was signed between FAO and the CBD in 2006, putting in place a practical framework for increased synergy between the two organizations in the area of biodiversity of relevance to food and agriculture.

6.3.2 The International Agricultural Research Centres of the Consultative Group on International Agricultural Research[43]

The first SoW report described the then 16 - now 15[44] - IARCs supported by the CGIAR. Over the past

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few years, the CGIAR System has been going through a major process of reform in its vision, governance, funding and partnerships[45] with the aim of achieving a more focused research agenda, greater coherence among the centres and increased collaboration with a wider range of partners. However, the management of the genetic resources collections is expected to remain a high priority for the system as are the genetic improvement of those food crops that are of greatest importance to the poor in the developing world.

Of the 15 centres, 11 have collections of PGRFA and are involved in one way or another with long-term conservation and plant genetic improvement (see Chapter 3). They not only make available material from their genebanks but also distribute to partners in both developing and developed countries, nurseries of advanced breeding lines, early generation segregating populations, parental materials, and lines with special characteristics (see Section 4.2). At the system level, there has been a number of significant developments since the first SoW report was published. These include greater emphasis on the breeding programmes on biotechnological tools and methods, including genomics, proteomics, MAS and the like; greater attention to participatory breeding approaches; major new partnership programmes for crop genetic improvement such as the GCP and Harvest Plus (see Section 4.7.4 and Box 4.1); and a large, system-wide initiative, now in its second phase, that aims to upgrade the collections and genebank facilities, known as "Collective Action for the Rehabilitation of Global Public Goods in the CGIAR Genetic Resources System".[46]

The centres have also continued to be heavily involved on an individual basis in a wide range of activities on the conservation and use of PGRFA. A large percentage of these involve international collaboration. By way of illustration, a few of many possible examples are given below:

- Africa Rice Center (formerly WARDA),[47] works with national programmes throughout Africa and provides leadership for the multicountry rice research network in West and Central Africa (ROCARIZ);
- Bioversity International (formerly IPGRI and INIBAP)[48] is exclusively devoted to agricultural biodiversity. It adopted a new strategy in 2006 that, while maintaining a focus on conservation, also gives greater prominence to the sustainable use of genetic resources for human well-being. Bioversity International is heavily involved with a large number of networks and partnership arrangements, e.g. it maintains an active association with all of the networks listed in Section 6.2.1;
- CIAT[49] and ILRI[50] both have major collections of tropical forages and CIAT has the largest collections in the world of cassava and beans. It facilitates a number of networks, for example the Pan-African Bean Research Alliance (PABRA);
- CIMMYT[51] maintains international germplasm collections of wheat and maize and facilitates crop improvement networks for both crops. It also plays a leading role in the Asian Maize Biotechnology Network;
- CIP[52] provides leadership for a number of regional networks on potato and/or, sweet potato as well as the Potato Gene Engineering Network (PotatoGENE);
- ICARDA[53] has helped establish genebanks in Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Morocco, Tajikistan, Turkmenistan and Uzbekistan. The significant contribution of ICARDA in the establishment of genebanks is recognized and described in the country reports of Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Morocco, Tajikistan and Uzbekistan;
- ICRISAT[54] works closely with national programmes in both Asia and Africa to promote germplasm conservation, enhancement and use. It plays a leadership role in the CLAN;
- IITA[55] has important collections of many tropical crops and works in close collaboration with national programmes, networks and other institutions throughout Sub-Saharan Africa;
- IRRI[56] convenes the International Network for the Genetic Evaluation of Rice (INGER)[57] and the Council for Partnerships on Rice Research in Asia (CORRA);[58]
- World Agroforestry Center, (formerly ICRAF), has a Genetic Resources Unit that partners with many institutions throughout Africa and beyond, in the conservation and evaluation of species for agroforestry systems.

As an adjunct to the work of the individual centres, the SGRP has been set up as a mechanism to help coordinate policies, strategies and activities across the system. SGRP aims to optimize CGIAR's efforts in five thematic areas: genetic resources policy; public awareness; information; knowledge and technology development; and capacity building. It has provided a focus for the technical input of the CGIAR to the negotiating process of the ITPGRFA and for negotiating the agreements with FAO bringing the centres' collections under the purview of the ITPGRFA.

In 2000, the CGIAR established the Central Advisory Service on Intellectual Property (CAS-IP) to assist the centres in managing their intellectual assets in order to maximize public benefit.

6.3.3 Other international and regional research and development institutions

There are a very large number of regional and international organizations involved in one way or another with the conservation and use of PGRFA. They range from highly technical international research institutes to the SGSV, a major new safety back-up facility for the storage of duplicate samples of accessions held in seed collections (see Section 3.5). Just five examples of regional and international institutions are given below: two have been established since the first SoW report was published, two are important agricultural research institutions that have gone through significant changes over recent years and one, the CBD, has significantly expanded its work related to PGRFA:

- World Vegetable Centre (formerly AVRDC):[59] headquartered in Asia, the World Vegetable Center maintains collections of many important vegetable species and makes them and materials arising from its breeding programmes, available to the world community in a similar way to those of the CGIAR centres. Since the first SoW report was published it has greatly expanded its activities in other continents, especially in Africa. It has set up and supported a large number of different regional and international networks;
- CATIE:[60] CATIE is an intergovernmental regional research and higher education centre located in Costa Rica. While it seeks primarily to serve its member countries,[61] it maintains germplasm collections of global importance. Since the publication of the first SoW report, CATIE has signed agreements with FAO bringing the collections within the International Network of *Ex Situ* Collections (see above). Both conventional seed as well as extensive field collections are maintained, with some of the most important ones being cacao (*Theobroma* spp.), coffee (*Coffea* spp.), peach palm (*Bactris* spp.), peppers (*Capsicum* spp.), cucurbits (*Cucurbitaceae*) and tomato (*Lycopersicon* spp.);
- CBD:[62] in November 1996, the third Conference of the Parties to the CBD adopted Decision III/11: 'Conservation and sustainable use of agricultural biological diversity', which, *inter alia*, established a multi-year programme of activities on agricultural biological diversity with the following goals:
  - promote the positive effects and mitigate the negative impacts of agricultural practices on biological diversity in agro-ecosystems and their interface with other ecosystems;
  - promote the conservation and sustainable use of genetic resources of actual or potential value for food and agriculture;
  - promote the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

PGRFA are also important in a number of the cross-cutting programmes of work of the CBD including the ecosystem approach, climate change and biodiversity, invasive alien species, the GSPC and ABS (see Chapter 7). In addition, the Cartagena Protocol on Biosafety, which came into force in 2003, has major implications for the conservation, management and use of PGRFA and in particular, the development and dissemination of GM-crop varieties.

- Crops for the Future:[63] created in 2008 as a result of a merger between the International Centre for Underutilized Crops and the Global Facilitation Unit for Underutilized Species, Crops for the Future seeks to promote and backstop research on those neglected and underutilized species which are considered to have a high potential for contributing to food security, poverty alleviation and protecting the environment;

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- ICBA:[64] ICBA was established in 1999 to address growing concerns about water availability and quality, initially in the WANA region but more recently at the global level as well. ICBA maintains and distributes an international germplasm collection comprising more that 9 400 accessions of some 220 saline and drought-tolerant species of crops and forages.

6.3.4 International and regional fora and associations

Regional and international associations and fora are becoming an increasingly important feature of international cooperation throughout the world, and in almost all areas of society. In fields related to agriculture, and that include activities on PGRFA, they include industry associations such as the ISF[65] and CropLife International;[66] farmers' organizations such as the International Federation of Agricultural Producers (IFAP);[67] international academic institutions such as the Third World Academy of Science (TWAS);[68] and environmental networks such as the IUCN.[69] The regional associations or fora on agricultural research for development are mentioned in Section 6.2.

A particularly significant development since the first SoW report was published was the creation of GFAR in 1999.[70] GFAR is an initiative that provides a neutral platform to promote discussion and collaboration among various stakeholder groups concerned with agricultural research for development. The regional associations and fora are key members of GFAR as are FAO, the CGIAR, farmers' organizations (represented on the Steering Committee by IFAP), civil society groups, private sector organizations, donors and others. GFAR held its first international conference in Dresden, Germany, in 2000, which resulted in the Dresden Declaration that identified genetic resources management and biotechnology as one of GFAR's four priority areas. Participants also drafted a separate declaration specifically on PGR that urged governments to meet their obligations to different international instruments, legislation and policies relating to PGRFA. GFAR has also been an active partner of FAO and the CGIAR in facilitating many activities relating to the GPA.

6.3.5 Bilateral cooperation

A large number of different national institutions, in both developing and developed countries, have international programmes in the area of PGRFA and these have increased significantly since the first SoW report was published, as is evident from the country reports. Such bilateral arrangements are far too numerous to list comprehensively and it is only possible to give a very general overview here. Institutions involved in regional and international bilateral activities include universities, national plant breeding and research institutes, genebanks, botanical gardens, etc.

Several developed countries have specialized governmental organizations devoted to providing technical assistance to developing countries. Many of these are involved in agricultural research and development, and initiatives involving the conservation and sustainable use of PGRFA have generally increased over the past decade. Examples include: the Cirad in France, the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) in Germany, the Istituto Agronomico per l'Oltremare (IAO) in Italy and the Japan International Research Centre for Agricultural Sciences (JIRCAS).

The growing importance of South-South Cooperation is pointed out in a number of country reports. Increasingly, institutions in developing countries are taking on international responsibilities, within the context of regional and international networks as well as in their own right. This is particularly true of universities and two examples are given in Chapter 4 Box 4.1: the ACCI established by the University of KwaZulu-Natal and the WACCI established by the University of Ghana. Some government institutions in developing countries are also expanding their international operations, for example the CAAS is increasingly posting staff overseas, and Embrapa has set up offices/laboratories in France, Ghana, the Netherlands, the Republic of Korea and the United States of America.

6.3.6 Non-governmental organizations

Over the last ten years, the involvement of NGOs has increased substantially in various aspects of PGRFA

and, as with other types of institutions, it is impossible to inventory them all. While activities have largely taken place at the national level, international activities have also expanded. For example, NGOs such as the Gene Campaign in India, the Action Group on Erosion Technology and Concentration (ETC Group) and Grain, among many others, were particularly active internationally when negotiations were in process for the ITPGRFA and in the context of various initiatives of the CBD such as those relating to indigenous knowledge and ABS.

Since the first SoW report was published, a number of new national NGOs have been set up concerned with conserving old varieties, especially 'heritage' or 'heirloom' varieties of fruits and vegetables. This has in turn, led to the creation of umbrella organizations and networks such as Safeguard for Agricultural Varieties in Europe (SAVE Foundation). Botanical gardens have also grown in number and strength over the past decade (see Section 3.9) and this has been reflected in the growth in membership of the umbrella organization, BGCI, which today includes some 700 members from almost 120 countries.

In addition to NGOs that focus primarily on plant diversity such as those previously mentioned, many developmental NGOs, both national and international, are also involved in the conservation and use of PGRFA, for example through projects that promote the management of PGRFA on farm or that promote traditional and high value crops and value added products. In an attempt to promote greater collaboration among such NGOs, a number of regional and international networks have been established, or expanded in scope, since the first SoW report was published. These include, for example, the Asian NGO Coalition for Agrarian Reform and Rural Development (ANGOC) and the CBDC mentioned earlier.

6.4 International and regional agreements

Arguably the most important international events associated with PGRFA since the publication of the first SoW report was the adoption in 2001 and entry into force in 2004 of the ITPGRFA.[71] As of August 2010, the ITPGRFA had been ratified by 125 countries and the European Union. Article 1.1 of the ITPGRFA states its objectives as, "the conservation and sustainable use of PGR for food and agriculture and the fair and equitable sharing of the benefits arising out of their use, in harmony with the Convention on Biological Diversity, for sustainable agriculture and food security."

The ITPGRFA covers all PGRFA and promotes, *inter alia*: conservation, exploration, collection, characterization, evaluation and sustainable use. It promotes action at the national level as well as international cooperation and technical assistance. One article is devoted to Farmers' Rights (see Sections 5.4.4 and 7.4) and a centrepiece of the ITPGRFA is the creation of an MLS for ABS that covers the 35 food crops and 29 forage genera listed in Annex 1 of the ITPGRFA. Developments with respect to ABS are described in detail in Chapter 7.

The ITPGRFA also promotes the implementation of the GPA and recognizes several other supporting components including the *ex situ* collections held by the IARCs, international PGR networks and the global information system on PGRFA. The Contracting Parties undertake to implement a funding strategy for the implementation of the ITPGRFA with the objective of enhancing the availability, transparency, efficiency and effectiveness of the provision of financial resources to implement activities under the ITPGRFA.

In addition to the ITPGRFA, a trend towards stronger regional cooperation in matters relating to PGRFA is also reflected in the growing number of regional agreements covering such areas as conservation, PVP, access to genetic resources and benefit-sharing. One area that has seen particular progress is phytosanitary regulations and these are covered separately below.

In Africa, regional agreements have been signed on PVP,[72] access and benefit-sharing, Farmers' Rights,[73] the conservation of natural resources,[74] and safety in the application of biotechnology.[75]

In the Americas, the Andean Community countries have adopted several regional agreements regarding PGR, two of the most important being the 1996 Decision 391 on a Common Regime on Access to Genetic Resources and the 1993 Decision 345 on Common Provisions on the Protection of the Rights of Breeders of New Plant

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Varieties. Central American countries have also drafted an agreement on access to genetic and biochemical resources and related traditional knowledge.

In Asia, in 2000, the Association of Southeast Asian Nations (ASEAN) countries agreed on a framework on access to biological and genetic resources and in 1999 the CIS countries adopted a multilateral agreement on cooperation in the sphere of conservation and management of cultivated PGR. In 2001, they also adopted an agreement on the legal protection of plant varieties.

In Europe, the European Union has adopted numerous European Community regulations and directives regulating such areas as seed production and distribution, IP and biosafety. National laws on PBR have, for example, been harmonized and a European Commission variety register established.[76] In the Nordic countries, the Nordic Council of Ministers adopted a Ministerial Declaration on Access and Rights to Genetic Resources in 2003.

6.4.1 Regional and international collaboration regarding phytosanitary issues

In 1997, a new text of the IPPC[77] was adopted. The number of members of IPPC has also risen considerably over the last decade, with 69 countries and the European Union out of the total membership of 172 having joined since 1996.

The 1997 revision of the IPPC was substantial and aimed to bring it up to date with current phytosanitary practices and in line with the concepts contained in the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) Agreement.[78] In addition to its implications for international trade, the 1997 text of the IPPC promotes the harmonization of phytosanitary measures and creates a procedure to develop International Standards for Phytosanitary Measures. It also introduces new phytosanitary concepts such as the designation of pest-free areas, the phytosanitary security of export consignments after certification and pest risk analysis.

The role of regional plant protection organizations (RPPOs) was also strengthened in 1997. In addition to promoting the objectives of the IPPC, RPPOs act as phytosanitary coordinators for their respective regions, promote harmonization of phytosanitary regulations and develop regional standards based on science and in harmony with international standards.

The first SoW report lists eight regional organizations; there are now ten. Although established in 1994, the Pacific Plant Protection Organization was not mentioned in the first report and the Near East Plant Protection Organization was established in 2009.

6.5 International funding mechanisms

With the growing recognition of the importance and value of PGRFA, an increasing number of donors have provided funds to support activities in this area, some in substantial amounts. One of the most significant funding developments since the first SoW report published was the creation of the GCDT. This specialized funding mechanism, that is also part of the funding mechanism of the ITPGRFA, is described in more detail below, followed by an update on the situation with respect to other multilateral and bilateral funding agencies.

- GCDT:[79] it has long been argued that in order to provide long-term sustainable funding for the conservation of PGRFA, an endowment fund is needed. Such a fund would build, preserve and invest its capital assets while using the interest generated to support conservation efforts around the world. With the adoption of the ITPGRFA in 2001, the way was opened up for the creation of such a dedicated funding mechanism, linked to the ITPGRFA. Thus, in 2004, FAO and Bioversity International (acting on behalf of the CGIAR centres) spear-headed the establishment of the GCDT. With its own Executive Board, acting under the overall guidance of the Governing Body of ITPGRFA and the advice of a Donor Council, the GCDT had, by early 2009, obtained total funding pledges amounting to more than USD 150 million. Funds have been provided by national governments, including some developing country governments, multilateral donors, foundations, corporations and private individuals.

In addition to managing the endowment, the GCDT has also raised funds to support the upgrading of collections and facilities, building human capacity, strengthening information systems, evaluating collections and targeted collecting. Efforts to date have concentrated on *ex situ* conservation and evaluation and a sizeable initiative has been undertaken, referred to earlier in this chapter, to formulate regional and global collaborative crop conservation strategies. These strategies are used to guide the allocation of the resources made available by the GCDT.

In spite of the success of the GCDT, there is still some way to go before the endowment fund can be considered large enough for the interest derived from it to be able to ensure that all the world's most important PGRFA are securely conserved;

- Multilateral and bilateral funding agencies: while it has not been possible to carry out a detailed inventory and analysis of trends in funding for PGRFA, it is evident that the number of agencies which support the conservation and sustainable use of PGRFA, including plant breeding, has grown somewhat since the first SoW report was published. The CGIAR, for example, now numbers some 47 countries as donors (including 21 developing countries) plus 4 foundations and 13 international and regional donor agencies. The large majority of these funders, directly or indirectly support research and development activities involving PGRFA. GEF remains a major funder of *in situ* conservation, including the conservation of CWR and is the principal funding mechanism of the CBD. The World Bank, a major supporter of the CGIAR, has provided funding not only for the centres' research programmes but has also provided a substantial injection of funds to bring the genebanks up to standard. Other multilateral funding agencies have also been active in supporting national and international projects and programmes that include activities on PGRFA. These include the Regional Development Banks, European Commission, International Fund for Agricultural Development (IFAD), Islamic Development Bank (IsDB), Organization of the Petroleum Exporting Countries) OPEC Fund for International Development, UNDP and UNEP.

Special mention should also be made of the FONTAGRO,[80] an alliance of Latin American and Caribbean countries together with the Inter-American Development Bank (IDB) and IICA, that provides funds to support agricultural research and innovation in member countries. Established in 1998, the Fund currently supports 65 projects, many of which, have a genetic resources component.

The number of foundations involved in funding PGRFA, especially those in the United States of America, has also increased in line with the overall growth of the philanthropic sector. Foundations that are involved in one way or another with funding international activities on PGRFA include the Bill and Melinda Gates Foundation, Gatsby Charitable Trust, Gordon and Betty Moore Foundation, Lillian Goldman Charitable Trust, Kellog Foundation, MacArthur Foundation, Nippon Foundation, Rockefeller Foundation, Syngenta Foundation and the United Nations Foundation.

In addition to multilateral agencies and foundations, many countries provide bilateral support for projects that include activities on the conservation and use of PGRFA. Most of the national development assistance agencies of the Organisation for Economic Co-operation and Development (OECD) countries, for example, are active in this area. Some countries also have specialized agencies dedicated to supporting research in developing countries, e.g. the International Development Research Centre (IDRC) of Canada, the Australian Centre for International Agricultural Research (ACIAR), the Swedish Agency for Research Cooperation (SAREC – now incorporated in the Swedish International Development Cooperation Agency, Sida) and the International Foundation for Science (IFS) of Sweden.

6.6 Changes since the first State of the World report was published

It is evident from the information presented in this chapter that in general, regional and international collaboration have advanced considerably since

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the first SoW report was published. While some networks are still under-resourced, a number of new institutions and partnerships have been established and old mechanisms strengthened. The ITPGRFA's MLS provides a mechanism that makes it easier for countries to share the burden of conservation, leading over time to a greater rationalization of collections (including the elimination of inadvertent duplication) and safety backup duplication and making it easier for countries to work together to conserve and use a wider range of genetic diversity. Key changes that have taken place include:

- the entry into force of the ITPGRFA in 2004 which marks what is probably the most significant development relating to PGR since the publication of the first SoW report. The ITPGRFA is a legally binding international agreement that promotes the conservation and sustainable use of PGRFA and the fair and equitable sharing of the benefits arising out of their use, in harmony with the CBD;
- several new regional PGRFA networks have been established, including GRENEWECA for West and Central Africa, NORGEN for North America, CAPGERNET for the Caribbean, PAPGREN for the Pacific, SeedNet for Southwestern Europe and CACN-PGR for the Central Asia and Caucasus region;
- other regional PGRFA networks have significantly strengthened their activities, e.g. SANPGR in South Asia, SADC-PGRN in southern Africa and the AEGIS and EURISCO initiatives of the European network ECPGR;
- many other regional PGRFA networks have not fared as well. While almost all networks need additional resources, insufficient funding was a major factor in the demise of WANANET and represents a major constraint for most of the networks in the Americas as well as Southeast Asia and West Africa;
- several new crop-specific networks have been established that have significant activities on PGRFA. These include, for example, international networks on cacao, the coffee genome, the rice genome and bamboo and rattan. New or reformed regionally-focused crop networks include ones on banana and plantain, cassava in the Americas, cereals and legumes in Asia, cassava in the Pacific and cotton in Asia and North Africa;
- several new thematic networks have been established, focusing on a range of different topics. For example, a number of networks have been created on biotechnology, both globally (e.g. the GCP) and in many regions. Other topics have included the on-farm management of genetic diversity and seed production. Three seed networks have been established in Africa alone;
- FAO supports the secretariats of both the ITPGRFA and the CGRFA. Relationships with the CBD were strengthened with the signing of a joint Memorandum of Cooperation in 2006;
- FAO has further strengthened its activities in the PGRFA area, for example, it established the GIPB in 2006;
- the international centres of the CGIAR have concluded new agreements with FAO, acting on behalf of the Governing Body of the ITPGRFA, bringing their collections within ITPGRFA's MLS of ABS. The CGIAR itself has been going through a period of major reform;
- the CGIAR centres have continued to work collaboratively with a very large number of partners, especially in developing countries and have continued to make available a wide range of genetic materials. A major programme has been undertaken to upgrade the collections and genebank facilities. In 2000, the CGIAR centres established the CAS-IP;
- several other new international institutes have been established that undertake research involving PGRFA. These include Crops for the Future and the ICBA;
- the SGSV, which opened in 2008, represents a major new international collaborative initiative to improve the safety of germplasm collections, through providing secure facilities for storing duplicate samples of seed accessions;
- another significant development since the first SoW report was published is the creation in 1999 of the GFAR. The Forum promotes discussion and collaboration among different stakeholder groups concerned with agricultural research. GFAR has identified genetic resources management and biotechnology as one its four priority areas;
- the trend towards stronger cooperation is reflected in the growing number of regional agreements

covering such areas as conservation, PVP, access to genetic resources and benefit sharing. One area that has seen particular progress is in phytosanitary regulations;
- several new foundations now support activities in PGRFA internationally. A special fund to support agricultural research in Latin America (FONTAGRO) was set up in 1998 and in 2004 the GCDT was established as a specialized fund dedicated to supporting the conservation of PGRFA and promoting its use worldwide.

6.7 Gaps and needs

In spite of the impressive progress made since the first SoW report was published, there are still a number of gaps and concerns that need to be addressed as a matter of urgency. These include:
- many networks have suffered from a lack of funds although several new networks have been formed. At least one has ceased to function. New and innovative funding strategies and mechanisms are needed;
- in order to underpin such funding strategies, increased efforts are needed to raise awareness among policy-makers and the general public of the value of PGRFA, the interdependence of nations and the importance of supporting increased international collaboration;
- greater collaboration is also needed among policy and funding bodies at the international level, and a greater awareness of the need for long-term financial support;
- with the strengthening of the regional and global fora on agricultural research, their influence with national policy-makers has grown and they offer valuable opportunities for promoting appropriate national and regional policies in areas of importance to the conservation and use of PGRFA;
- given that international germplasm exchange is a key motivation behind many networks, additional attention is needed both to promote the effective implementation of ITPGRFA and in particular, its MLS of ABS, as well as to develop arrangements for those other crops that are not currently included in the system but that are within the overall scope of the ITPGRFA;
- in order to benefit from many of the regional and international opportunities for collaboration, there is a need in many countries for greater internal coordination among different ministries and institutions and between the public and private sectors.

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