

International Technical Conference on Plant Genetic Resources: Preparatory process for Europe



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21 November 1995, Sopron, Hungary

Preface

FAO is convening the International Technical Conference on Plant Genetic Resources, in Leipzig, Germany, 17-23 June 1996, in response to requests by the FAO Conference and the UN Conference on Environment and Development. The Conference is expected to adopt the first Report on the State of the World's Plant Genetic Resources and a costed Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources, which will provide a strategy to guide international cooperation on plant genetic resources for food and agriculture in the coming years. The preparation of the two documents was called for by UNCED in its Agenda 21. They will be elements of the FAO Global System for the conservation and utilization of PGR.

In line with the recommendations of the Commission on Genetic Resources for Food and Agriculture (formerly the Commission on Plant Genetic Resources) a participatory, country-driven preparatory process has been initiated. Country Reports have been received from over 150 countries, including 40 countries from Europe. This volume contains the Synthesis for Europe, prepared on the basis of these Country Reports (Part I).

A regional preparatory meeting for Europe, one of a series of eleven regional and subregional preparatory meetings, was held in Nitra, Slovakia in September 1995. FAO and IPGRI are grateful to the Government of Slovakia for hosting the meeting, and wish to extend special thanks to the staff of the Agroinstitut Nitra for their warm hospitality and efficient support. Thirty-five countries and the European Community, as well as observers from international and non-governmental organizations, participated in this meeting to develop proposals for the Global Plan of Action. The report of the preparatory meeting for Europe is also contained in this volume (Part II).

In recognition of the specific needs and opportunities in the area of conservation and sustainable use of forest genetic resources, the European Forest Genetic Resources Workshop was held in Sopron, Hungary, in November 1995 as part of the preparatory process. The recommendations developed at the Workshop are included as Part III of this volume. The support of the staff of the University of Sopron in organizing this workshop is gratefully acknowledged.

The preparatory process itself has catalysed the development or consolidation of national programmes for plant genetic resources in many countries. These documents provide an assessment of plant genetic resource activities in Europe, and a record of the region's recommendations for improving the conservation and sustainable utilization of plant genetic resources. While the primary purpose of the three documents is to contribute towards the development of the Report on the State of the World's Plant Genetic Resources and a costed Global Plan of Action, in preparation for the International Technical Conference, by publishing them in this volume, IPGRI and FAO hope to promote their wider use.

Part I.

Regional Synthesis on the Status of Plant Genetic Resources in Europe



Preface

This synthesis report was drafted by IPGRI for FAO's International Conference and Programme for Plant Genetic Resources, preparatory meeting for Europe, to facilitate discussions concerning the conservation and utilization of plant genetic resources in the region, and in particular to highlight important gaps and needs. The meeting commended IPGRI and the secretariat for the quality of the report and was satisfied that the contents represent a good synthesis of the information included in the Country Reports. The report was revised following the meeting to take into account minor modifications suggested by the different countries. However, no attempt was made to reach a consensus on every element of the report. As agreed at the meeting, the draft recommendations for the Global Plan of Action, included in the draft report, were removed, having been superseded by the recommendations adopted at the meeting. The meeting commended the report to the attention of the secretariat as a working document for the preparation of the Global Plan of Action.

The preparation of this report was made possible through the close collaboration of many whose contributions in reviewing Country Reports and drafting the Synthesis are gratefully acknowledged, in particular Helen Ager, Zofia Bulinska Radomska, Muriel Colas, Hareya Fassil, Emile Frison, Thomas Gass, Stefano Padulosi, Jane Toll and Jozef Turok.

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Introduction

1. The region and its agricultural sector

The region includes all countries of geographic Europe, Israel, all Newly Independent States of former USSR (with the exception of those of the Caucasus and Central Asia, included in the Regional Synthesis for Central Asia) and covers an area of 27 779 752 km² from Reykjavik to Vladivostok and has a total population of 850 251 000 inhabitants. The absence of deserts and unpassable mountainous chains in the region has facilitated the communication among people thus contributing to mixing populations from various ethnic and cultural backgrounds. Europe is one of the most urbanized region in the world, with more than two-thirds of its population living in cities. The highest population density is found in countries such as Belgium, Germany, The Netherlands, and the UK, whereas the lowest is recorded in northern and easternmost countries like Finland and Russia. On average the population density is 30.3 inhabitants/km².

The total arable land (which includes the area covered by permanent crops) is equivalent to 393 448 593 ha (14.1% of the total territory). Forest and woodlands are distributed over 1 133 984 000 ha, an area equivalent to more than 40% of the territory of the whole region.

The main forest types belong to the boreal, temperate and Mediterranean forest zones. Despite the worrying trend in forest decline observed particularly in central and eastern Europe, forest is increasing in numerous countries thanks to effective afforestation programmes (e.g. in Germany, 10 000 ha of land are being converted annually into forests).

Agriculture and forestry represent an important component of the economy of the region, their contribution to the GDP ranging from 1 to 16%. The degree of specialization and intensity of agricultural systems varies according to countries, and within a country according to the degree of development of its regions. Differences among countries lie between the areas with intensive, highly mechanized agriculture systems on one hand and less developed regions and marginal areas on the other hand. The economic situation in the latter restricts the use of mechanization, fertilizers, certified seed and other agricultural inputs.

Political and social changes in recent years in eastern European countries have brought about important changes in the agricultural systems. A common situation faced by these countries is the reduction of funds allocated by governments to the agricultural sector. This has had strong negative repercussions on the level of agricultural productions. Russia reports that an estimated 20% of its population has inadequate nutrition due to shortage of agricultural products.

Private farms are the most common type of farm ownership. Public farms are being privatized in many eastern European countries. Farm sizes vary considerably across the region and within countries (average farm sizes in Austria, 28 ha; in Greece, 4-5 ha; in Ireland, 23 ha; in Norway, 10 ha; in the UK, 71 ha).

2. Plant genetic resources of the region

Vegetation types in Europe are very varied, ranging from the tundra of northern Scandinavia to the semi-arid land of the Mediterranean marquis. The last glaciation during the Pleistocene and the long period of human intervention on nature (agriculture has been introduced into the region 10 000 years ago) have had a profound effect on the natural vegetation, determining the reduction of naturally

occurring plant communities and the introduction of alien species from other regions.

There are at least 12 500 species of vascular plants in Europe of which 3500 are endemic. Most represented families are the Compositae (1326 spp.), Gramineae (880), Leguminosae (840), Caryophyllaceae (655) and Cruciferae (649). Countries with the highest number of native species include France (4650), Greece (5000), Italy (5600), Spain (5050), the Former Republic of Yugoslavia (5350) and Turkey (9000 native, 3000 endemic).

Within the region there are primary centres of diversity for many crops, some of which also have centres of diversity in other parts of the world, for example cereals (barley, oats, rye, wheat), legumes (lupins, vetches, peas), fruits (apple, pears, cherries, plums, ribes, fig, grapes), nut trees (chestnut, hazelnut), vegetables (carrots, brassicas, beets, artichokes, lettuce), industrial crops (hemp, safflower, flax, hop), oil crops (olives), forages (*Trifolium*, *Festuca*, *Lolium* and *Medicago* spp.), medicinal (*Digitalis* spp., *Papaver somniferum*, *Valeriana* and *Althea* spp.) aromatic and condiments (caraway, anise, thyme, sage, mint). Of these, several are also common in other parts of the world.

Europe is also a secondary centre of variability for species brought here in classical times (*Citrus*) or in later periods (tomatoes). These have since then further diversified through the selection work of farmers.

The most important crops grown in the region are cereals (wheat, barley, rye) vegetables, root crops (potatoes), forages/ fodder species, industrial crops (cotton, tobacco, sugar beets), and fruit trees. The variety of ecosystems present in Europe has favoured the accumulation of a unique array of genetic diversity within cultivated crops. This process of crop domestication and selection occurring over hundreds of years has concerned major and minor species.

The region is also home to a great diversity of useful plants belonging to the category of underutilized species, that is crops with recognized economic potentials which could give a substantial contributing to agricultural diversification and provide users with a more varied diet. This group includes useful species which have been completely/ partly domesticated (such as rocket, capers, water cress, corn salad, liquorice, pomegranate, quince, *Allium* spp., and carob tree) or plants that are being used directly from the wild (most medicinal species and condiment/aromatic plants).

Indigenous forest species which are ecologically and economically most important in the region are: *Picea abies*, *Abies* spp., *Pinus* spp., *Quercus* spp. and *Fagus sylvatica*. *Pseudotsuga menziesii* is the main exotic forest tree species. Forest tree species show high and mostly natural diversity in a wide range of ecosystems. Forestry prevalingly works with genetic material from the wild, not altered by breeding.

Genetic erosion

The development of agriculture from traditional farming systems to modern types of cultivation has been instrumental in allowing the progress of rural regions. This process has at the same time been the direct cause for the replacement of traditional varieties and landraces with improved high yielding ones. Genetic erosion is particularly strong in eastern European countries (with the exception of Poland) where extensive cultivation has been established over large areas once reservoir of a great array of crop genetic diversity with modern high yielding varieties replacing local landraces. Landraces are potential sources of resistance to abiotic and biotic

stresses. Loss in genetic variation has been less intensive in remote areas where these traditional varieties are grown in small cultivation and patches of land.

Pollution, fires and environment degradation also contribute to the genetic erosion of both cultivated and wild species. Overgrazing has caused the impoverishment of many native grasslands and has prevented the regeneration of woodlands. The unsustainable use of natural resources has resulted into disturbed water balance and severe erosion.

The discouragement of the cultivation of landraces by current legislation has also had a strong negative impact on their conservation. Italy reports that out of 41 farms growing landraces of forage legumes in the 1970s only one now carries through this activity.

In general fruit trees seem to have been less affected by erosion in comparison to other agricultural crops. Among species reportedly under threat of erosion are both cultivated (e.g. lentils, chickpeas) and naturally occurring crops (e.g. *Artemisia granatensis*, *Satureja*, *Thymus* spp., *Taxus baccata*, *Beta maritima*, *Sideritis* spp., *Origanum* spp., *Nepeta cataria*, *Digitalis lanata*, *Astragalus dasynthus*, *Calamintha nepeta*).

Europe is the only continent where an increase in the area covered by forests is being recorded. The increase in afforestation of marginal sites results mainly from structural changes which have occurred in agriculture. Loss of genetic diversity due to air pollution and other anthropogenic factors is still a worrying phenomenon with regard to intraspecific variability of forest species.

Assessment of PGR Programmes and Activities

1. National Programmes Policies and Legislation

Characteristics of the region

The history of plant genetic resources activities in Europe and the perspectives on conservation and use of these resources is influenced by a number of varying factors. Within political, social and economic groupings, countries share similar policies, strategies and organizational structures.

In the countries of the European Union (EU), the agricultural and environmental sectors that incorporate plant genetic resources conservation and use, are shaped by common policy, importantly the EU Common Agricultural Policy. Three of the five Nordic countries are members of the EU, but a dominant feature of plant genetic resources activities in these countries is their collaboration in a regional organization, the Nordic Gene Bank (NGB).

The programmes of the eastern European countries have in common the influence of Vavilov and thus germplasm introduction, study and maintenance historically in a prominent place in their agricultural research systems. Bulgaria, Hungary, Poland and Romania have central lead plant genetic resources institutes, and those central programmes of Czechoslovakia and the Socialist Federal Republic of Yugoslavia have divided with the break-up of these states.

Until the dissolution of the USSR, one institute, the N.I. Vavilov Institute (VIR) in St. Petersburg, directed activities on the genetic resources of cultivated plants in all countries of the former Union. The newly independent states are now developing separate programmes and in Russia, the operations of the VIR are undergoing corresponding modification. New cooperative country groupings are arising. The Baltic States are establishing a regional programme in collaboration with the Nordic countries. New collaborative linkages are being explored between the Central Asian States of the former USSR as well as linkages with their neighbours in West Asia, and the plant genetic resources activities of the sub-region are the subject of a separate report.

Organizational structures

The conservation of crop and forest genetic resources in European countries falls to separate institutions often under the auspices of different ministries. The degree of contact and coordination between the two sectors depends on the nature and level of integration of the country's programme(s) on genetic resources. Generally, the programmes are separate; forestry conservation using both *in situ* and *ex situ* methods, crop conservation, principally *ex situ*.

National programmes on the conservation and use of plant genetic resources are broader in scope and more diverse in constitution than simply genebanks. However, in many countries, genebanks or the specialized institute dealing with PGR are the focal points of the national programme.

In both western and eastern Europe, the collecting of plant genetic resources and the establishment of *ex situ* germplasm collections commenced with the purpose of meeting the immediate needs of national plant improvement programmes. Consequently, crop germplasm collections are typically held by agricultural research institutions and enterprises, primarily as breeders' working collections. Notable exceptions to this origin are the genebanks in Italy (National Research Council (CNR), Bari) and in Turkey (Aegean Agricultural Research

Institute (AARI), Izmir). Both were established with specific conservation objectives to secure, on a regional basis, the genetic resources of the Mediterranean region and of the West Asian centre of crop diversity.

In most countries of western Europe, existing *ex situ* germplasm collections are typically dispersed among both government and private plant breeding and research institutions. However, most countries are taking, or have taken, measures to consolidate existing collections and secure their conservation on the long-term in genebanks under government funding and the responsibility of Ministries of Agriculture.

In the Netherlands, collections are centralized at the Centre for Genetic Resources (CGN) which has special national status and responsibility for agricultural plant genetic resources. It is administered and funded by the government. In Greece, Ireland, Israel, Portugal, Spain and Turkey, there are designated national genebanks, but the role and responsibilities assumed by these genebanks differ. In Israel, the Israeli Genebank is specifically charged with securing the genetic resources, collecting, preserving and evaluating plant species indigenous to the Mediterranean region.

Austria, France, Germany, Italy, Switzerland and the UK have more decentralized *ex situ* conservation systems involving several genebanks which hold particular categories of germplasm. In Germany, these genebanks are under federal and regional government administration and funding. In the UK, the government guarantees the funding of the key collections although some are actually held by private breeding institutions. In Austria, four government institutions under Federal Law are mandated to conserve germplasm relative to their area of research. The Swiss Federal Office of Agriculture recognizes 16 collections with genebank status. These are maintained by a range of federal, regional and private institutions on their own budgets. In France, the collections are held by a range of government, private and non-governmental organizations, and measures are underway to bring them together in a network with national status.

In Belgium, the need for a government body to assume responsibility for plant genetic resources conservation and to coordinate and consolidate the country's collections and develop a national programme, has been recognized as of high priority.

In the Nordic countries, activities are centralized at regional level at the Nordic Gene Bank (NGB) at Alnarp, in Sweden. The genebank is funded by the Nordic Council of Ministers, the implementing agency of Nordic cooperation, and is governed by a Board of Trustees comprising representatives from each country. The countries of the European Union have mandated the European Commission, through the European Parliament, to coordinate genetic resources activities within the Union.

Most programmes in eastern Europe are characterized by the presence of a central or a lead institute with responsibility for *ex situ* crop genetic resources conservation. In Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia, these institutions are government administered and funded and come under the responsibility of the Ministries or Academies of Agriculture or Science. Typically they originated with a strong focus on crop genetic resources and have responsibility to hold the national base collection and coordinate the active and working collections at institutions around the country.

The Research Institute of Crop Production in Prague maintains the Czech national base collection and formerly had the same mandate for the Czechoslovakian state. Currently it holds Slovakian material pending completion of

the new national genebank of Slovakia. As a means to improve collaboration on plant genetic resources activities within the country and to improve economy in the use of resources and funds, the Ministry of Agriculture of the Czech Republic instigated the National Programme on Plant Genetic Resources. It is coordinated by the institute in Prague and involves both government and the private breeding institutes that hold active collections.

A national programme for crop genetic resources has also been created in Slovakia. It falls under the guidance of the Ministry of Agriculture, but receives participation and funding from the Ministries of the Environment and of Education. It is coordinated by the Research Institute of Plant Production at Piestany and its available funds are being used to construct the seed genebank at Piestany.

The genebank in Romania was created by a government decree and has status as a national institute under the Ministry of Agriculture.

In Poland, the National Department of Plant Genetic Resources at the Plant Breeding and Acclimatization Institute is the central long-term store, documentation centre and coordinator of a national programme that involves many institutes and universities. The funding is from the Ministry of Agriculture on an annual basis and has been disrupted in recent years.

The genebank at the Bulgarian Institute for Introduction and Plant Genetic Resources holds seed germplasm, but the field collections of vegetatively propagated crops held at institutions around the country, are not integrated into its programme or fall under its responsibility. Funding is through the Academy of Agriculture, but is insufficient to support the programme to take on new initiatives in *in situ* conservation and international collaboration.

Croatia and the Federal Republic of Yugoslavia (Serbia and Montenegro) have launched new national initiatives to establish plant genetic resources programmes, but in both cases development and implementation of activities have been severely curtailed by the current economic and socio-political situation. In Croatia, a project at the Department of Plant Breeding of the University of Zagreb aims to establish an *ex situ* base collection and *in situ* conservation sites for national plant genetic resources. It is under government support, but receives very limited funding. In the Federal Republic of Yugoslavia (Serbia and Montenegro), the Ministry for Development, Science and Environment, launched a project in 1989 to consolidate the country's collections and establish a Yugoslav Genebank, but funding constraints have halted the project.

Following the independence and the break with the VIR, all three Baltic States have launched national projects on crop genetic resources within the framework of a regional collaborative project with the Nordic countries. The projects are sponsored by the government, primarily the Ministries or Academies of Agriculture and involve government institutions from the agriculture and forestry research, the environment sector and universities and botanic gardens, but as yet, no private or non-governmental organizations. A lead institute of each country has been mandated to centralize documentation on existing collections and hold a national active collection, with the base collection duplicated at the Nordic Gene Bank.

In Russia, the N.I. Vavilov Institute (VIR) is the only institution with responsibility for crop genetic resources conservation and its collection has been accorded the status of the national collection of Russia.

With the break from the VIR, the newly independent states of the Former Soviet Union are developing new national programmes. The Ukraine has established the National Centre for Plant Genetic Resources under the auspices of the Academies of Agriculture and Science and Ministries of Agriculture and Forestry. The Centre is

located at the Plant Production Institute in Kharkov and coordinates genetic resources activities among all the national institutions and stations holding collections.

In Belarus, the Research Institute for Agriculture and Forages, formerly a branch station of VIR, has developed a proposal to create a National Centre for Plant Genetic Resources. The Academy of Agricultural Sciences was unable to support it due to lack of funds, and the country now seeks international assistance for this.

In 1991, Moldova established the Laboratory for Genetic Resources at the Institute of Genetics to be the national genebank. The only funding is from the Institute and too low to establish facilities and activities. Furthermore the Laboratory has yet no government status or mandate.

In Armenia, the Laboratory for Cultivated and Wild Plant Genetic Resources of the Armenian Agricultural Academy worked closely with VIR until independence. Now the country has adopted a programme for the protection of its natural resources, that includes measure for action and legislation on *ex situ* conservation and use of plant genetic resources. Implementation of the programme is retarded by lack of funds and civil unrest and the country is seeking international support to equip and finance the laboratory to be a national genebank.

Coordination within countries

The inter-sectorial nature of plant genetic resources conservation and use, and the importance of coordinating activities among the different institutions concerned, is well recognized in the majority of programmes in the Region. Most have in place some sort of mechanism to coordinate efforts and responsibilities, and many have advisory bodies to provide guidance. Coordination is seen as particularly important by those countries with decentralized systems of conservation and essential for cost-effective use of resources and funds.

Austria and Switzerland have established, respectively, a Genebank Working Group and Commission on Crop Genetic Resources as coordinating and advisory bodies. In Germany, an Information and Coordination Centre (ZADI) has been established and as advisory bodies, an Expert Council for Plant Genetic Resources and Crop-specific Committees, are planned. In the Netherlands, the Centre for Genetic Resources coordinates operational activities, a special inter-departmental ministerial level committee handles policy matters, and an Advisory Committee representing government, private and NGO institutions meets annually to approve the Centre's programme. The UK Plant Genetic Resources Group which represents *in situ* and *ex situ* conservation bodies from both public and private sectors, acts as an advisory group to the Government on plant genetic resources matters. The recent UK Government review of plant genetic resources activities has recommended the establishment of an Interdepartmental Group to examine funding priorities and strategies. In France, coordination of genetic resources activities within the country and internationally, is the task of the "Bureau des ressources génétiques" (BRG). To ensure intersectorial cooperation, the BRG was established as a "Groupement Scientifique" that associates several of the country's research institutions (INRA, CNRS, CIRAD, ORSTOM, MNN, GEVES) as well as the ministries in charge of agriculture, research and environment.

The government of Greece established the National System of Conservation and Protection of Genetic Resources of Cultivated Plants, specifically as a means to bring together the genebank, which holds seed collections only, the field genebanks of vegetatively propagated species held by other institutes and the *in situ* conservation areas. The Israel Genebank at the Volcani Centre, Bet Degan acts as the

coordinating and central service centre for the country's network of plant genetic resources research centres and collections and coordinates and cooperates with the ministries of Agriculture and of Science and the Arts in a number of *in situ* conservation studies. The genebank in Turkey at AARI, Izmir, is the coordination centre of the National Plant Genetic Resources Project which brings together government institutions and universities working in genetic resources conservation and use. In Portugal, the linkage of the National Genebank to other institutions and ministries involved in plant genetic resources, is not yet formalized, but there is national consensus for a coordinated programme and a National Information System on Plant Genetic Resources has been initiated.

The Nordic Gene Bank (NGB) has linkages to the various national organizations involved in plant genetic resources in its member countries. In Denmark, Finland, Iceland and Norway there are national committees to oversee activities at the country level that include representation from its key institutions and the members of the NGB Working Groups. Sweden expresses the need to establish a national coordinating committee in view of the broadened scope of activities and responsibilities on plant genetic resources at the national level to meet the requirements of the Convention on Biological Diversity.

The restructuring of the Polish programme and the reorganized programmes in the Czech Republic and Slovakia, are designed for improved sharing of efforts and resources among the different institutions involved. In the Czech Republic, the National Board for Plant Genetic Resources, which comprises curators, breeders and other specialists from the public and private sector, acts as an advisory body and mechanism of coordination. The new Polish programme plans to establish a Board for Crop Genetic Resources.

In Romania, the genebank has established a National Committee comprising representatives from the other institutes and botanical gardens. It is not an official structure, but does seek to assure coordination of the genebank's programme with other activities in the country. In Bulgaria, coordination between the genebank and other *ex situ* activities, even with the breeders, is recognized as in need of strengthening. It is proposed to develop a national strategy which brings together *ex situ* and *in situ* conservation activities, and secures legal status, coordination and funding for the programme.

National Boards for plant genetic resources comprising representatives from all concerned institutions, have been set up in each of the Baltic countries to oversee the new projects underway. In a number of countries, crop specific committees or working groups have been established to coordinate the inventory, maintenance and study of germplasm on a crop or crop-group basis. These bodies, which include breeders, curators and other keepers of collections of the particular crop, are critical in the consolidation of existing collections; an important initial step currently underway in many new programmes, in particular those needing to rationalize their holdings. In the Ukraine, the inventory and databasing of existing collections is being organized by crop specialist groups.

The status of ex situ conservation

Some programmes appear to have adequate institutional structures and capacities, and satisfactory levels of government commitment and support, to provide relatively secure long-term conservation of plant germplasm *ex situ* to meet the needs for use in plant improvement. However, difficulties with funding are being experienced by many countries, particularly in eastern and southern Europe, and deficiencies in facilities, personnel and funds confront the emerging programmes of

the newly independent states. Furthermore, the political support for activities is mainly coming from the ministries or institutions directly involved and not from higher levels. Consequently, plant genetic resources programmes are being hit along with general cuts in funding to agricultural research. Even where programmes are recognized in national law, for example in Greece, it does not necessarily guarantee status and long-term funding.

All programmes of the Region are facing a challenge in broadening scope from a relatively narrow focus on conservation of plant germplasm for use in plant breeding, to include the new directions required in Agenda 21 and the Convention on Biological Diversity. This requires a shift to encompass strategies to conserve plant genetic resources *in situ*, both in the wild in natural habitats and through cultivation on farm and in gardens and orchards

In situ conservation

A number of countries have formulated, or are in the process of formulating the National Action Plan as required for the implementation of Agenda 21 and the Convention on Biological Diversity (CBD). Responsibility for the Plan usually lies with the environment ministries, however, in several countries, the inter-sectorial dimension is being taken into account and the plans incorporate broad-scope programmes for genetic resources conservation that involve the environmental as well as agricultural sector and *in situ* as well as *ex situ* approaches. This is evident, for example, in the initiatives underway in EU countries, the Czech Republic, Poland, and Switzerland. The Nordic Gene Bank has adjusted its strategies to be consistent with the CBD and an ad hoc working group on wild species is presently responsible for follow-up on Convention matters. The strategies and methodologies for *in situ* programmes and how best to link them to the established systems for *ex situ* conservation, are being investigated in a number of countries, such as France, Germany, Israel and Turkey. Many existing programmes are forging stronger linkages with the environment sector with the government departments as well as through new partnerships with non-governmental organizations (NGOs).

Conservation of agrobiodiversity *in situ* through cultivation on farm, in homegardens and orchards, agricultural and village museums, experimental stations, etc. is carried out in a number of countries in response to governmental and general public interest in the “greening” of agriculture through the use of more traditional organic and integrated farming systems. These concepts are particularly well developed in Germany, the Nordic countries and Switzerland, and are now under consideration by countries of the EU in view of the reforms of the Common Agriculture Policy aimed at encouraging the preservation of agricultural landscapes, traditional farming systems and agrobiodiversity on-farm. In many countries, NGOs are active in this area. In addition, obligations to the Convention require countries to put into place the necessary legislation and policy for the conservation, sustainable use and accessibility of plant genetic resources at national and international levels.

Policies and legislation

Existing legislation on nature protection, forestry, agricultural development and scientific research impact on the conservation and use of plant genetic resources, quarantine regulations and trade laws impact on their availability. All countries of Europe state that the plant genetic resources in their existing collections are freely available to bona fide users, and many state their adherence to the International Undertaking (Table 1). In the case of the wild species collection originating from

countries worldwide, RBG Kew, UK distributes seed under royalty sharing agreements which allow for the apportioning of profits with the country of origin should the material be commercialized.

In general, the legal status of existing *ex situ* collections is not defined and responsibility for the distribution of material lies with the curator; only rarely with a higher authority. There are a few programmes and genebanks in the Region recognized under national law, for example Greece and Turkey, but the majority, although receiving government support in various forms, is not explicitly under national ownership.

The privatization of agricultural research institutes in many of the eastern European countries has given rise to concern over ownership and security of maintenance of collections, with instances of collections now in private hands no longer accessible to government or other scientists, and others of collections having been abandoned. Privatization of land is having an impact on forestry conservation as gene and seed reserves fall into private hands and out from national legislation. A number of countries request advice on how to deal with the implications of privatization.

All countries have long established legislation for nature protection, covering both the protection of areas and of specific species. Typically nature conservation laws define the category of the protected area as national park, nature reserve, natural landmark, site of special scientific interest, etc., and the degree of protection they are subjected to. In the case of species protection laws, species listed as endangered, rare, etc. are protected from disturbance and trade, and may also be covered by international conventions such as Convention on International Trade in Endangered Species (CITES). Species laws tend not to include cultivated species, but they may cover related wild species or forestry species and therefore contribute to the *in situ* conservation of genetic resources. For example, wild *Vitis vinifera* ssp. *silvestris* and *Taxus baccata* are protected under the German Federal Nature Conservation Act. Forest preservation is covered by the nature conservation laws, but in addition most countries have specific legislation regulating the exploitation and management of forests which supports the conservation of forest genetic resources *in situ*.

Legislation governing trade in seed and planting material has implications for the conservation of plant genetic resources. Under forest law, the source of seed and planting stock introduced into the natural forests and the source of reproductive material taken from the forests for planting elsewhere, is regulated. Under these laws, specific species and stands may be protected as seed sources or gene reserves, which contributes to the conservation of forest genetic resources *in situ*. In the case of agricultural crops, seed or variety laws regulate the production and marketing of seed and other reproductive material to varieties registered in the official country variety catalogue. Registration in the EU, for instance, requires a variety to be distinct, homogeneous, stable with a new value for cultivation and the seed or plant material to be certified for sale. New improved varieties displace older cultivars from the catalogues, and the latter become no longer available on the market because the varieties are no longer registered and the seed no longer certified and produced. In a number of countries of eastern Europe, seed and variety laws are being modified along the lines of legislation prevailing in the rest of Europe. In the EU, there is a common variety catalogue which permits the trade of registered varieties among the countries of the Union. Currently, seed legislation within the Union is under review to bring it in line with the reform of the Common Agricultural Policy and its measures to promote the use of traditional varieties. The

current discussion in the European Council is on permitting the marketing of old varieties in small seed lots. In Switzerland, seed law has already been modified along these lines.

All countries have some sort of property rights legislation on plant varieties. Most commonly, the legislation is in the form of Plant Breeders' Rights (PBR) and follows UPOV regulations. These laws give the breeder exclusive right to market the variety over a period of time while the variety is also registered. Usually these laws grant "breeders' exemption" which permits the use of protected varieties as genetic resources in further breeding. In many cases the laws also provide for "farmers' exemption", thus allowing farmers to save and reuse seed of protected varieties on farm. PBR legislation is, as yet, not fully harmonized within the EU, and in eastern Europe, existing laws are being brought in line with UPOV regulations. Legislation regarding GATT/TRIPS and the application of patents, is under discussion or being developed in a number of countries of the Region. The contracting parties to the European Patent Treaty have taken the decision that animal and plant varieties will not be patented. There are differences of opinion as to the effect of International Property Rights (IPR) on the accessibility of genetic resources, with some countries requesting these issues to be studied. East European countries, currently reviewing their legislation on plant varieties and genetic resources, specifically request legal advice on these issues.

In all countries of the Region, the import and export of plant genetic resources, whether in seed, whole plant or in vitro culture form, is subject to quarantine regulations. Import of plant material must comply with restrictions on quarantine diseases and export, with the regulations of the recipient country. New regulations within the EU require, for a number of crops, the sender of seed to guarantee freedom from quarantine diseases. This may require the genetic resources programmes to do more work on disease screening.

2. Regional programmes and networks and international collaboration

"Crises do not exist in the scientific world. On the contrary, scientific problems occur every day and need to be solved from the theoretical and practical points of view. Those problems are endless and can be solved on the basis of international scientific collaboration only."

(N.I. Vavilov)

Dialogue and collaboration is viewed by all countries in the region as essential for promoting the conservation of biological diversity. In recent years two major developments have significantly modified the context of collaboration in Europe.

Until the mid-eighties, collaboration at the technical level has been confined, with some exceptions, within eastern and western Europe. This cleavage is rapidly disappearing, opening new prospects for cooperation at a global level and particularly in Europe. The large increase in collaborative projects between institutions of the former East and West blocs, the intensive and active participation of former East bloc countries in cooperative programmes and the accession of countries like the Russian Federation to the CGIAR donor community show that collaboration in Europe has taken a new meaning and dimension. This will have to be taken into account in the development of existing programmes and the establishment of new ones.

Another factor that has profoundly modified the international collaboration is the increased awareness of the importance of institutions of the non-governmental

sector (NGOs). With the rapid development of communication techniques, these traditionally 'less coordinated' institutions, have developed effective networks at national and international levels and are actively involved in decision-making. In several countries NGOs are now included in consultation procedures, sit in genetic resources advisory committees or boards of genebanks and participate in joint projects with the national programme.

United Nations initiatives

The United Nations Conference on Environment and Development (UNCED) is seen by the European countries as an important step forwards and is expected to have a positive influence on the conservation of plant and forestry genetic resources. The Rio Agreements, Agenda 21, the Rio Declaration on Environment and Development and the Agreement on forest principles were adopted by consensus by the UN Assembly. Although these agreements are not legally binding, several countries are actually adopting their principles in their national plans and strategies. The commitment to Agenda 21 is also shown through the region's strong participation in the Global Environmental Facility (GEF). In the region, 18 countries participate in GEF, totaling a pledge of 490 million US\$ (i.e. 48% of the total pledges; Ref. Table 1). Some countries (Denmark, France) have established their own additional global environmental facility with which they fund projects of global significance on a bilateral basis.

The Convention on Biological Diversity has been signed by 37 countries in Europe. Out of these 37 countries, 23 have also ratified the Convention. Despite the relatively high proportion of countries having ratified the Convention, several of them declare that concrete measures to implement the Convention's provisions (particularly Articles 14G and 15) are still pending. It should also be noted that countries with important genetic resources collections such as Belgium, Bulgaria, Ireland, Israel, Poland and Turkey have not yet ratified the Convention. All the countries which have in their reports expressed an opinion on the sharing of responsibilities between the Conference of the Parties to the Convention on Biological Diversity (COP/CBD) and FAO's Commission on Plant Genetic Resources (CPGR/FAO) have declared that aspects related to plant genetic resources for food and agriculture should be dealt with by CPGR/FAO. CPGR/FAO is expected to strive to harmonize the text of the International Undertaking with the text of the Convention. While close interaction and complementarity between COP/CBD and CPGR/FAO is to be sought, COP/CBD is expected to recognize the expertise of CPGR/FAO in this particular field.

The Forest Principles of Rio constitute a first global consensus on the management, protection and sustainable development of forests. Further development of these principles into a legally binding forest convention is under discussion within the framework of the UN Commission on Sustainable Development (CSD). With regard to international collaboration these principles are particularly emphasized in the German report.

The Commission on Plant Genetic Resources of FAO (CPGR/FAO) is described in most of the reports as being an essential forum for dialogue, information and orientation of policies. The French report emphasizes the value of involving scientific and technical institutions, decision makers and NGOs in this forum. It also mentions the usefulness of convening actors of the genetic resources conservation to report on their activities before the Commission. CPGR/FAO as an institution and the International Undertaking as a policy framework have been mentioned by several countries to have played an important role in the

development of their national programmes. Table 1 provides details on membership to this commission and accession to the International Undertaking.

The International Network of Collections (under the auspices of FAO) is seen by many countries as an important element of future collaboration. Those countries which have expressed their opinion about it, are all favourable to the principle of such a network of *ex situ* collections under the auspices of FAO. To this day, 10 EU countries, as well as the Czech Republic, the Russian Federation and Switzerland, have indicated their willingness to include their collections into the International Network of *ex situ* collections under the auspices of FAO. In many reports, the countries' Base Collection responsibilities, as they were agreed with IPGRI (at the time IBPGR), are mentioned as part of a country's input in kind to the global effort to conserve genetic resources (Table 3). The status of these collections needs to be addressed and their setting under the auspices of the FAO needs to be further discussed.

In addition to an international *ex situ* network, several countries emphasize that more needs to be done in the area of *in situ* conservation. Germany mentions its support for a global *in situ* network and Greece, Switzerland and Turkey express the wish that the programmes of the International Plant Genetic Resources Institute (IPGRI) are developed so as to include more *in situ* conservation activities. Regarding *in situ* conservation, the Man and Biosphere Programme (MAB) adopted in 1970 within the framework of the United Nations Educational, Scientific and Cultural Organization of the United Nations (UNESCO) is mentioned in several reports. This programme also comprises projects for the conservation of biodiversity and genetic material within a network of biosphere reserves.

Regarding the collaboration with FAO in plant genetic resources at programme level, several countries have mentioned with appreciation the role played by FAO/UNDP projects in the development of their national programme (Bulgaria, Czech Republic, Turkey). An ongoing project is mentioned by the Czech Republic in which genetic material from various institutions in the country is regenerated and included into long-term storage in the national genebank. The ESCORENA programme of FAO is discussed under 'Regional collaborative programmes'.

International cooperation in agricultural research

The Consultative Group on International Agricultural Research (CGIAR) is an association of countries, international and regional organizations and private foundations co-sponsored by the World Bank, UNDP, FAO and UNEP. CGIAR's commodity centres hold significant plant genetic resources collections and are involved in their improvement. Within the CGIAR, the International Plant Genetic Resources Institute (IPGRI) is the institution specialized in plant genetic resources.

With a few exceptions, all countries declared that they have varying degrees of collaboration with CGIAR's commodity centres. All of the centres dealing with crop and/or forest species are mentioned. CIMMYT, CIP and ICARDA are mentioned most frequently regarding germplasm exchanges. CIAT, ICRISAT, IITA, IRRI and the three centres dealing with forestry issues (CIFOR, ICRAF and IPGRI) are mentioned more frequently within the context of development cooperation or collaborative research projects. Many countries in the region declare having benefited from the germplasm exchanges with CGIAR's commodity centres. The implementation of a System-wide Genetic Resources Programme (SGRP) coordinated by IPGRI within the CGIAR has been mentioned and welcomed by a number of countries.

The collaboration with IPGRI is mentioned in all the reports. The Institute is described as an important actor in the area of genetic resources. Much emphasis is laid on IPGRI's role in the development of national programmes, in raising awareness for genetic resources issues, in supporting collecting missions and in promoting international cooperation. Several countries have expressed their wish that IPGRI become still more involved in technical support and national programme development. Greece, Switzerland and Turkey wish to see IPGRI develop further its programmes on *in situ* conservation, particularly regarding the wild relatives of cultivated crops.

The positive role of the International Union of Forestry Research Organizations (IUFRO) in promoting collaboration in forestry research is mentioned in many of the reports. IUFRO's programme includes genetic resources as a subject area, and there are currently more than 20 working groups dealing with this aspect.

Regional collaborative programmes

The European Association for Research on Plant Breeding (EUCARPIA) has drawn attention as early as 1962 to the threat to genetic diversity in the wild relatives of our crop plants. In 1968, a Genebank Committee was set up. This Genebank Committee recommended the initiation of the European Cooperative Programme for Crop Genetic Resources Networks (ECP/GR).

The European System of Cooperative Research Networks in Agriculture (ESCORENA) was established by FAO in 1974 on recommendation of the European Commission on Agriculture (1972). Within this programme 10 crop-specific networks and three ad-hoc research groups are currently operational, dealing to a varying degree with the problems of genetic resources. Regarding the collaboration in the area of genetic resources the ESCORENA programme was particularly mentioned by the Czech Republic (Flax Network), Portugal (Olive Network), Slovakia (Flax and Soybean Networks), and Spain (Olive and Sub-Tropical Fruit Networks). Institutions from most countries in the region participate in ESCORENA (Table 2).

The European Cooperative Programme for Crop Genetic Resources Networks (ECP/GR) is a collaborative programme among most European countries aimed at ensuring the long term conservation and facilitating the increased utilization of plant genetic resources in Europe (Table 2). The Programme is entirely financed by the participating countries and is coordinated by IPGRI. It operates through crop-specific working groups in which curators and/or breeders, representing their countries, work together to analyze the needs and set priorities for the crop concerned. Working group members and other scientists from participating countries carry out an agreed workplan with their own resources as inputs in kind to the Programme. The Programme is overseen by a steering committee composed of national coordinators nominated by the participating countries. In 1994, ECP/GR has entered into its fifth phase which will last five years. Currently, seven working groups are active (*Allium*, *Avena*, Barley, *Brassica*, Forages, *Prunus* and Grain Legumes). The initiation of further groups is under discussion (namely concerning wheat, *Malus*, documentation, etc.). In their reports, most countries emphasize the important role of ECP/GR in promoting regional cooperation in the area of crop genetic resources. Several countries mentioned that they would like to see the programme expand further to include other species.

The European Forest Genetic Resources Programme (EUFORGEN) was established in 1994 following the recommendation of the Ministerial Conference on the Protection of Forests in Europe in Helsinki (1993). The main tasks of

EUFORGEN are to coordinate and promote the *in situ* and *ex situ* conservation of forest genetic resources in Europe and the exchange of expertise and information. The Programme is coordinated by IPGRI in close collaboration with the Forestry Department of FAO. Pilot networks have been established for Norway spruce (*Picea abies*), cork oak (*Quercus suber*), black poplar (*Populus nigra*) and noble hardwoods. Presently, 20 European countries have joined the programme and 8 more have expressed their intention to join in the near future (Table 2). Cooperation in the area of forest genetic resources is also mentioned with regard to the European Forestry Institute (EFI). This is an independent European non-governmental research association established in 1993 with headquarters in Finland. EFI deals *inter alia* with questions of sustainable management and biodiversity of European forests.

Within the European Union (EU), two programmes actively promote collaborative activities dealing with genetic resources. Both programmes are underpinned by the objectives of the Common Agricultural Policy of the EU. The European Programme for Conservation, Characterization, Collection and Utilization in Agriculture (EC 1467/94) promotes the collaboration within its member countries to document, rationalize and ensure the safety of existing plant and animal *ex situ* collections. The programme explicitly excludes research measures. It was drawn up for a period of 5 years and funded with 20 million ECU (66% for plant genetic resources). The Research Framework Programme of the European Union (4th Framework Programme 1995-1998) provides funds for collaboration in research, *inter alia* in genetic resources.

In situ conservation activities are supported by Council Regulation (EEC) No 2078/92 "on agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside". This Regulation provides "aid for farmers who undertake: ...to use other farming practices compatible with the requirements of protection of the environment and natural resources, as well as maintenance of the countryside and the landscape, or to rear animals of local breeds in danger of extinction; ...to ensure the upkeep of abandoned farmlands or woodlands; ...to set aside farmland for at least 20 years with a view to its use for purposes connected with the environment, in particular for the establishment of biotope reserves or natural parks or for the protection of hydrological systems..."

The Israel genebank and the Italian CNR/RAISA cooperate in a programme (Peace Campus) aimed at the study of conservation of crop plants germplasm in nature reserves within the middle east and Mediterranean region. A survey of progenitors of agricultural crops in natural reserves in Israel is currently coordinated with the support of the European Parliament at Strasbourg.

An Italian-funded project on the Conservation and Use of Underutilized Mediterranean Species (UMS), also has networking activities as its principle component. Institutions from 7 countries in the region participate in this project which currently coordinates networks on pistachio, rocket, oregano, and hulled wheats. The UMS networks also include institutions from countries from North Africa and West Asia.

Generally, countries have expressed their satisfaction with the possibilities for collaboration now open to their institutions. It has been stressed by some that the level of coordination between these programmes should be increased. Regarding the level of integration of conservation activities between countries, opinions diverge. Some countries are in favour of a stronger integration and the sharing of responsibilities on a crop basis (France, Germany, The Netherlands, UK). These countries have to some extent already implemented a sharing of conservation

responsibilities. In some cases they have donated collections considered of minor interest to other countries or to commodity centres of the CGIAR. The particular case of the Nordic Countries (Denmark, Finland, Iceland, Norway and Sweden) should also be mentioned. Here, long-term conservation responsibility is given to one common, jointly funded institution, the Nordic Gene Bank. Other countries (mainly in eastern or southern Europe) are in favour of intensive collaboration, but do not wish an integration of collections at this stage.

A number of institutions (Table 3) have entered into agreements with IPGRI (at the time IBPGR) in the 1970's and 1980's to serve as regional or global base collections. At its second session (March 1987), the FAO Commission on PGR decided to establish an International Network of *ex situ* Base Collections under the auspices of FAO as foreseen by the International Undertaking. Following the establishment of IPGRI as an independent CGIAR institution, and a Memorandum of Understanding (MOU) signed between FAO and IPGRI, collections holders were notified that IPGRI would no longer enter into such agreements and were encouraged to include their collections into the FAO International Network of *ex situ* Base Collections. The status of these collections and the mechanism to bring the collections within the FAO network need to be discussed. It is suggested that, for the crop collections maintained in Europe, negotiations begin rapidly in each country, in the European Union and collectively within ECP/GR.

Bilateral cooperation

A significant part of the cooperation related to genetic resources and most of the basic collaborative work in Europe has to this day been carried out through bilateral agreements at institutional or governmental levels. This form of cooperation has a long tradition in Europe, is valued and is expected to remain important despite the development of multilateral programmes. Often, multilateral cooperative programmes (ECP/GR, ESCORENA, EUCARPIA) have been instrumental in the development of these bilateral agreements. Besides collaborative research projects or joint collecting missions, bilateral agreements in Europe often concern the genetic resources collections themselves (sharing responsibilities for joint collections, agreements on safety duplication, temporarily storing another country's collection while a new genebank is being established, etc.). Important examples of this in the region are formal agreements between Germany and the Netherlands concerning Beta and wild species of potato. This German-Dutch collaboration is going to be restructured and extended. Institutional agreements exist between the Centre for Genetic Resources, The Netherlands (CGN) and Horticulture Research International (HRI), Wellesbourne, UK on the joint management of *Allium*, *Lactuca* and horticultural *Brassica* species. Additionally, a number of less formal agreements between other genebanks (e.g. between Italy and VIR).

International cooperation of non-governmental organizations

Many non-governmental organizations are active within the region or carry out actions in other regions from their headquarters in Europe. The projects support very heterogeneous local initiatives and are not centrally recorded. Partners are farmers' associations, cooperatives and local non-governmental technical and welfare organizations. A characteristic feature of development cooperation at the NGOs level is the clear poverty orientation and the restriction of cooperation to small and subsistence farmers. As the perspective of alleviating poverty by modernizing agriculture is seen with scepticism, NGO's priority has shifted to projects of site-adequate sustainable agriculture with increasing attention to seed

issues. Purely seed-oriented projects that promote traditional rather than modern seed are gaining momentum. The following NGOs which are engaged in development cooperation also promote international seed action networks: Genetic Resources Action International (GRAIN) and Rural Advanced Foundation (RAFI). In 1993, the Community Biodiversity Development and Conservation Programme (CBDC-Programme) was established to improve conservation and utilization measures at village level through community based seed management. The four-year programme and a coordinating office of the CBDC are co-financed by NGOs and some government sources.

The International Federation of Organic Agriculture Movements (IFOAM) is an international federation of associations and initiatives to promote organic farming and also advocates a sustainable use of plant genetic resources in the production process.

The association of ecologically minded foresters in Europe PRO SILVA (founded in 1989) is a federation of national or regional associations in 18 European states. PRO SILVA promotes the European cooperation between foresters, forest owners and forest friends to ensure and conserve forest ecosystems.

The International Union for the Conservation of Nature (IUCN) submitted a global programme on the conservation of biodiversity in 1992 including the sustainable use of genetic resources. Many European Governments, government agencies and nature conservation associations are represented in IUCN.

Numerous national or non governmental botanic gardens are represented in the International Association of Botanic Gardens and in the Botanic Gardens Conservation International (BGCI). BGCI has set up a database on all species and provenances represented in the affiliated botanic gardens with the aim of promoting the exchange of plants between gardens. The Organization for the Phytotaxonomic Investigation of the Mediterranean Area (OPTIMA) has decided to establish a taxonomic reference collection for Mediterranean species at the Botanical Gardens of Palermo, Italy.

Cooperation with other regions

In describing their collaboration regarding genetic resources, many countries have mentioned strong links with countries or institutions in other regions. Two of the Mediterranean countries (Cyprus, Turkey) are members both of ECP/GR and of the IPGRI coordinated Network for West Asia and North Africa (WANANET). The Nordic Countries have strong collaborative ties with the SADC countries in southern Africa and have supported the establishment of a regional genebank in Lusaka, Zambia.

Many countries in the region have governmental agencies entrusted with the cooperation with developing countries. Most of these have included strong elements of conservation (*in situ* and *ex situ*) and sustainable use of genetic resources in their projects (DANIDA, GTZ, SDC, SIDA). In France two specialized institutions dealing with tropical and sub-tropical agriculture (CIRAD and ORSTOM) maintain large collections of fruit trees and other perennial species. CIRAD and ORSTOM are also intensively involved in collaborative networks in developing countries (coconut, coffee, etc.). Many of these have important genetic resources conservation and utilization components in them. Italy has played an important role in the establishment of the genebanks at CIAT, ICARDA and IITA.

Strong collaborative links exist at bilateral level between countries in Europe and countries or institutions in other regions. This cooperation includes seed exchange (particularly with Australia and the USA), joint collecting activities (in

Europe in collaboration with Australia, Japan and USA; in developing countries in collaboration with the local national programme), bilateral research agreements (many developing and industrialized countries) and training or scientific exchanges particularly related to genetic resources (France, Germany, Italy, the Nordic countries, UK).

The European Tropical Forest Research Network (ETFRN) was established in 1991 by the EU Commission in order to promote the cooperation between research institutions, governments and industry concerning the tropical forest and to support the exchange of information and cooperation between institutions.

3. Conservation Activities

Ex situ activities

The conservation of plant genetic resources for food and agriculture is generally carried out by the agricultural research sector. Typically, the collections have been assembled to serve national plant breeding needs and are therefore located at government or private sector plant breeding institutions. They include introduced and local advanced and old cultivars, breeding lines and special genetic stocks, and to a lesser extent indigenous and foreign landraces and wild species of crops of importance to European agriculture. However, indigenous genetic resources have received special attention in the collections of countries in the Mediterranean and Near East centres of crop diversity, such as Greece, Israel, Italy and Turkey. Some countries, notably France, hold collections of tropical crops. The majority of collections maintained are of seed crops; cereals, pulses, vegetables and forage species. Generally, the species have desiccation tolerant seeds and can be conserved in conventional seed genebanks. There are some major vegetatively propagated crops, such as potato, grape and fruits, and these are maintained as whole plants in the field or, where the technique and facilities are available, also in vitro culture.

European countries generally have well-established genebanks that meet internationally recommended standards. Albania and newly independent states such as the Baltic states, Belarus, Ukraine, etc., are putting into place the necessary facilities. In some countries the genebanks have national status and hold the country's base collections for all or a large range of crops, for example in Greece, Israel, the Netherlands, Portugal, Spain, Turkey and the genebanks of eastern European countries. In the case of the Nordic Gene Bank, its mandate is regional. In other countries such as Austria, France, Switzerland and the UK, the genebanks are specialized with a mandate for the conservation of particular crop or crop-groups.

In addition to the leading role played by agricultural research institutions, all countries include botanical gardens, repositories and arboreta in national efforts on *ex situ* conservation of plant genetic resources including forestry resources. These collections are mainly in living form, at the species level and are not managed or documented in the same way as the crop genebank collections. Furthermore, although their holdings are recorded, they are not generally integrated into overall conservation strategies for the species in question. This remains a task for most of the national programmes of the region. The seed genebanks of the Royal Botanic Gardens, Kew, UK and the Botanic Garden, Copenhagen, Denmark, are of special note.

Genebank procedures

Most national or nationally mandated genebanks have responsibility for the long-term conservation of base collections of the species under their mandates, for the registration of new germplasm, the distribution of samples to users, and the study and multiplication of the holdings. Regeneration and characterization may be done on site at the genebank, or at other locations in the country or region where the environment is more suitable or where active and working collections are maintained.

Countries report that in the case of seed crops, regeneration is carried out when accession stocks or viability fall below acceptable levels, and the thresholds quoted comply with international recommendations. Mention is made of the difficulties, costs and risks to accession genetic integrity, associated with regeneration, particularly of out-breeding species. The Greek and Turkish genebanks draw attention to the difficulties of dealing with small collected samples of wild species and the need for early cycles of regeneration to build up stocks for distribution. Research on the reproduction biology of wild species is called for in order to determine regeneration cycles. The genebank of the RBG, Kew has a strategy to gather as much seed as possible at the time of collecting and store all the sample under optimum conditions for longevity, to avert the need for initial regeneration. Few comments were made about difficulties in handling the regeneration load, other than some accessions being unavailable for distribution because of insufficient seed quantity and the need for regeneration.

The differentiation of collections in base and active collections is a procedure commonly employed in seed genebank operations in order to manage the frequency of regeneration by maintaining the base collection under optimum conditions for maximum longevity and only drawing on the active collection for use. Most base collections are stored under the internationally recommended long-term conditions of 3-7% seed moisture content in hermetic packaging at -200C. Genebanks with these facilities report no difficulties in obtaining the long seed life spans, expected. VIR and some of the other programmes in eastern Europe have a routine of regular regeneration of their collections, partly because long-term storage facilities are not available, but more often because the germplasm is essentially curated only as an active collection. The genetic consequences of frequent regeneration are not noted and may not be significant for a large part of the collection which is of homogenous accessions, however, because of the costs and staff required, VIR has installed improved storage facilities in order to reduce the frequency of regeneration.

Most genebanks are characterizing their collections according to international descriptors such as the IPGRI, COMECON and UPOV lists and documenting passport and characterization data. Most documentation systems are computerized; others are being computerized, such as VIR's. However, the evaluation of collections and the extent to which evaluation data is documented vary among collections and between countries. In western Europe, evaluation is typically carried out by the user to meet specific breeding needs and there may not be a mechanism by the genebank manager can retrieve the findings for the central database. In the eastern European programmes, the influence of Vavilov has given rise to the practice of systematic and exhaustive agronomic, physiological and biochemical evaluation to screen germplasm for adaptation, disease and pest resistance, and commercial potential. These procedures are well established in the VIR system.

Few programmes in western Europe are active in collecting and mostly acquire new germplasm through introduction and exchange. The international collecting activities of RBG, Kew, CGN, the Netherlands, CNR, Italy and IPK, Germany, are

exceptions. The countries within the Mediterranean and Near East centres of crop diversity plant have been active in collecting their indigenous plant genetic resources.

Programmes in eastern Europe, particularly VIR, have a history of national and international collecting, but these activities have been severely curtailed by the poor current economic situation. However, some of the central European countries, for example the Czech Republic, Poland and Slovakia, are continuing their collecting activities on indigenous plant genetic resources in cooperation with neighbouring countries. The programmes are also characterized by extensive germplasm acquisition including introduction of commercially available cultivars. These practices are being forced to change for economic reasons and the programmes required to set priorities for germplasm acquisition.

National collections

A common task facing all programmes of the Region is the definition of a national collection. The Convention on Biological Diversity obliges countries to conserve their indigenous genetic resources, *in situ* and *ex situ*, to meet broad development needs. This requires the identification of *in situ* conservation sites and, in the case of existing *ex situ* collections, their consolidation and rationalization into collections representative of available indigenous diversity and inclusive of other diversity of potential importance to the country. For many collections, particularly those at breeding institutes in western Europe, this means breaking the link with short-term breeding objectives and setting long-term conservation priorities. In France this process of defining national collections is currently underway and in other countries collections have been consolidated. In the Netherlands, CGN has rationalized its collections in order to optimize the cost-effectiveness of the maintenance and utility of the material. Accessions with similar genetic backgrounds are identified and grouped according to passport, characterization and, where available, genetic data and bulked. Overall, few programmes report undertaking inventories of the genetic diversity in the country (*in situ*) and in collections (*ex situ*) although these are prerequisites for conservation programmes that are effective and economic, and constitute obligations to the Convention and Agenda 21. The size of collections in the Region, particularly those in eastern Europe where there has been a tradition of extensive cultivar introduction, needs to be considered. The need to install long-term seed storage facilities with capacities for 50 000-plus accessions, as is the intention in some countries, can be questioned.

In general, the level of safety duplication of collections in Europe is difficult to judge. Much of the material, particularly in some of the eastern European collections, is advanced cultivars which are common to many genebanks. However, few programmes have, as yet, identified unique holdings and ensured their safety duplication. This is underway in France and the Nordic Gene Bank security duplicates its collection in the permafrost of the Arctic.

In situ conservation

The programmes on crop genetic resources conservation in Europe have been almost exclusively directed to *ex situ* conservation. Within all countries, *in situ* conservation is pursued by measures to protect specific habitats and measures to protect specific species, and directed at conservation at ecosystem and species level. With the exception of forestry, any conservation of indigenous wild species of agricultural importance *in situ* in nature occurs as an unplanned result of these systems of nature protection. All countries have areas of forest, other natural vegetation and specific habitats, protected under legislation. Most countries have surveyed and identified endangered native species, drawn up “red” lists and put in place measures to protect these species and the habitats where they grow. However, only a few countries have specifically surveyed the status of wild species related to crops within their networks of protected areas or outside, for example, Israel, Portugal, Switzerland, Turkey and the former German Democratic Republic. Israel has conducted pioneering research on *in situ* conservation strategies for wild wheat. Bulgaria and France have projects underway on the *in situ* conservation of forages, crop wild relatives and medicinal plants, and the Czech Republic is planning such an activity. Turkey has recently initiated a project to conserve, *in situ*, crop-related wild species, fruit trees and forest species with support from the Global Environmental Facility (GEF). Turkey is preparing legislation for *in situ* conservation.

Protected areas are a main method of conservation of forest genetic resources. In addition, the forestry programmes of most countries have identified selected stands as gene reserves. *Ex situ* conservation methods include the establishment of clonal archives and seed orchards of specific species, and seed and pollen genebanks. Forest genetic resources activities are generally conducted through programmes on forest protection and seed production. The species conserved are generally those of economic importance for forest product production or for reforestation. A few programmes have undertaken studies of genetic diversity and put in place measures to conserve specific diversity.

Many countries show a growing interest from the agricultural research sector and the general public in the conservation of agrobiodiversity *in situ*. The success of plant breeding in producing new varieties and the effects of legislation in restricting seed trade to certified varieties has resulted in the almost total disappearance of landraces and old cultivars in most crops of western Europe. Old varieties can be found only in fruit trees, pasture plants and in some garden vegetables, or in specific locations and farming systems in mountainous or remote areas. In eastern Europe, the replacement of traditional varieties was accelerated by collectivization and the establishment of large acreage farms. However, in countries such as Poland or in remote mountainous areas, where small farms persisted, the use of landraces continues. In both West and East Europe, there is a renewed action to collect these landraces and conserve them *ex situ*, and new initiatives to preserve their maintenance *in situ*. The latter is largely in response to Agenda 21 and the Convention on Biological Diversity and the promotion of sustainability in agricultural production and environmentally-friendly farming. Measures to retain, reintroduce and thereby conserve landraces and old cultivars *in situ* on-farm through use are being explored in a number of countries, particularly the Nordic Countries, Switzerland, Germany and in other EU countries. The reform of the EU Common Agricultural Policy promotes the preservation of agricultural landscapes, traditional farming systems and agrobiodiversity on-farm. Non-governmental organizations are particularly active in a number of countries in promoting the

conservation and use of local crops and varieties, for example in France, Ireland, Switzerland and the UK. In Germany and Sweden, for example, agricultural folk museums are prominent in maintaining and making available the landraces and old cultivars.

4. Uses of plant genetic resources in the sub-region

The panorama of the utilization of plant genetic resources is rather complex, as it differs from country to country and depends a lot on the type of crop. In eastern European countries priorities are being directed towards a maximization of agricultural production. In western Europe, over production of major food crops is an important constraints and has brought about a number of EU regulations and directives for its solution. In these countries, there is at the same time a growing demand for a wider choice and variety of horticultural crops, for which diversity in taste, colour, nutritional values and earliness/ lateness is highly valued by the market.

Use of genebank material

The level of utilization of PGR stored in genebanks is difficult to be assessed. Beyond the number of accessions distributed every year by a genebank there is a general lack of feed back documentation on the final use of the distributed material. Genebank managers often report the lack of feed back as a major obstacle for monitoring PGR utilization both at home and in the other countries requesting the material. The degree of utilization of local varieties/ landraces is strongly affected by national and international legislation which limit the marketing of those varieties not officially registered in seed catalogs. Most countries distribute germplasm accessions from national collections and related information on a free basis to all *bona fide* users.

Certified seed is available in most European countries and it is produced mostly by private firms, local or multinational: the level of utilization of this material much depends on the economic possibilities of farmers.

Priorities in breeding activities vary according to each country: breeding for resistance to abiotic and biotic stress and for quality traits is becoming more and more a priority over the breeding for yield. Biotechnology is seen as an important tool for enhancing the breeder's capacity.

There is a growing concern over the fate of germplasm material which is of no more direct interest to breeders: it is strongly felt that the community needs to be assured that lack of immediate use of PGR would not lead to a lesser attention from conservationists towards such resources. Documentation is seen as a basic need for ensuring a better utilization of PGR. However, effective systems in place are available only to a limited number of countries. A computerized documentation would ensure efficiency and facilitate cooperation among research centres within the region and within countries, yet this service is available only in a few countries. Publication of relevant information on PGR holdings, language barriers, use of non-standardized formats for documenting PGR, are obstacles, among others, that prevent from a proper utilization of plant genetic resources in the region. Complete characterization and evaluation of germplasm holdings is available only in a few genebanks. The lack of a coordination mechanism within countries regarding the work carried out by different institutes/ organizations in this field results in the serious limitation of the utilization of PGR. A more coordinated approach in this area is needed.

Natural regeneration becomes the generally favoured silvicultural approach, both for coniferous and broad-leaved forest tree species. Reproductive material for artificial reforestation and new afforestations is mostly sampled in the wild. Forest stands with superior phenotypic performance are certified for seed procurement in most countries. A significant proportion of improved seed material from breeding programmes is only used in Nordic countries. The collection and movement of forest reproductive material is subject to national legislation in almost all European countries. Self-sufficiency in the supply of adequate reproductive material characterizes most countries. Seed storage in seed banks is commonly used in several forest tree species, but the possibilities of long-term storage are limited due to technological and evolutionary constraints. Restitution and privatization of forest property in many eastern and central European states is a lengthy and complex process. Its long-term impacts on forest genetic resources will have to be studied.

A good example of effective collaboration at the international level on characterization and evaluation is given by the Nordic Gene Bank initiative.

The increasing interest on underutilized crops stated in many reports should be translated into concrete actions that would create possibilities for better conserving these crops while contributing substantially to agricultural diversification.

New trends in utilization

In a number of countries, a nature-friendly breeding approach is being encouraged. This approach is orientated towards a more rational use of germplasm for producing crops less exigent in chemical products. A less conventional as well as more public-driven approach to conservation and use of PGR is also making its way, by the inclusion for instance of other species (e.g. ornamentals for landscaping purposes and minor / neglected or underutilized species) in conservation activities or by having a “more horizontal” focus on crops (devote more attention to groups of crops -leafy vegetables, spices etc.- rather than to single species). Creation of labels like the D.O.C. (dénomination d’origine contrôlée) is also pursued as a means to favour the conservation and use of underutilized/ neglected crops.

Needs and Opportunities

In general, country reports include a wide coverage of the needs in the area of PGR but a relatively small number of reports also mentioned opportunities.

1. Needs

National Programmes

European countries, almost without exception, have identified as the single most important need the establishment of a well-functioning National Programme. Such a programme should include all relevant partners, from various competent ministries, research institutes, universities, private partners and NGOs.

The establishment of national programmes should rest on an adequate legal basis and an appropriate policy and institutional framework taking into consideration relevant international agreements.

National programmes should be based on a strong commitment to the long-term conservation of PGR of the country and the sustainable use.

In order to be effective, it is felt that a national programme should have reliable and stable funding mechanisms to ensure the essential activities relating to the conservation of PGR. An effective coordination mechanism is also extremely important in order to avoid duplication of efforts and to make best use of the available resources. Such a coordination mechanism is also important for an effective participation in international collaborative efforts.

Most countries find that insufficient resources are allocated to PGR activities and in many cases the funding is insecure in the long-term.

Definition of what should constitute the national collection, and therefore come under a long-term governmental commitment for conservation, is an issue highlighted by a number of countries.

It is recognized by many countries that the “informal sector” including NGOs, farmers’ associations, and various other types of associations can play an important, and often a complementary, role in the conservation and sustainable use of PGR. Links between the formal and informal sectors need to be established in the framework of national programmes. Some countries recommended to encourage the creation of NGOs and associations which would be actively involved with PGR activities.

The importance of the role of plant breeders in the conservation process was emphasised and that collaboration between the genebank itself and its users should be further improved.

Policy makers, and those who influence them, need to be well-informed on the importance of PGR activities and on the need for a public investment in the conservation of PGR which is, by definition, a long-term investment. Efforts have to be made to raise the public awareness and concrete activities have to be implemented to this end.

Several east and south European countries have expressed the need for external financial support for PGR activities. Several newly independent states expressed the need to implement a national programme and equip facilities, and require external funding for this. The safeguard of existing *ex situ* collections which are threatened by economically unstable and difficult situations and the emergency collecting of material under threat *in situ* also require external financial support. Forest genetic resources which are, as a rule, conserved *in situ*, are threatened by the

extensive privatization of forest land in several central and eastern European countries.

Several countries have expressed the need for legal advice for the development of variety protection legislation.

Regional and international collaboration

Regional and international collaboration is a second point which is recognized by almost every European country as particularly important.

The inter-dependence of countries in the area of PGR makes collaboration a must. No country is self-sufficient in PGR nor can all countries accumulate resources which would satisfy all their needs.

Almost all countries feel that further strengthening of collaboration at local, regional and international levels is needed.

International collaboration is also needed to achieve an agreement regarding access to genetic resources which many countries perceive as important.

Several countries feel that more support is needed for collaborative efforts and most Nordic countries report the level of funding of the NGB as being insufficient.

Ex situ conservation

All newly independent countries and several other countries both in eastern and western Europe indicate a need to develop an infrastructure or increase the capacity or performance of the existing infrastructure for the conservation of PGR. Most countries referred specifically in the case of agricultural crops to good long-term storage facilities for orthodox seeds but several countries also included infrastructure for in vitro conservation of vegetatively propagated species or species with recalcitrant seeds.

Several countries recognize the need to restrict the size of national collections to the germplasm originating in the country and of particular value to it, in order to be in line with the expected level of sustainable funding.

Several countries also expressed the need to carry out regeneration of germplasm with low viability. Methodologies for regeneration of germplasm respecting the genetic integrity of the accessions still need to be improved, especially for outcrossing species.

Accessions in short supply also need to be multiplied under good conditions in several countries.

Many European crop collections are still not adequately duplicated and important accessions are at risk. Safety duplication is therefore needed as a matter of priority. The identification of unique accessions can be greatly facilitated by the development and analysis of regional databases.

Several countries have identified significant gaps in their collections and indicate that collecting has to be carried out. In many cases it is felt that this should be in the framework of international collaborative efforts. Other countries want to see the completion of an inventory in order to identify gaps in their collections before engaging in further collecting.

Quarantine aspects relating to the safe movement of germplasm has been mentioned by several countries as needing more attention.

In situ conservation

The development and the improvement of appropriate legislation for *in situ* and on-farm conservation of plant genetic resources for food and agriculture (PGR-FA) was mentioned as an important need by many countries throughout Europe.

The designation of protected areas relevant to the conservation of PGR-FA is also needed in several countries and a collaboration between the relevant authorities in charge of these designations and specialists in the agricultural GR is needed. The need to develop appropriate methodologies for *in situ* conservation is also perceived by several countries.

Continued utilization of landraces by farmers, especially in marginal areas but also in biological agriculture systems is seen as a method of on-farm conservation which can play a considerable role.

Characterization and evaluation

The characterization of germplasm is perceived as insufficient by several countries. These steps are essential to make the resources more readily accessible and more useful to breeders. These tasks require substantial inputs, and funding levels are often reported as insufficient to allow these activities to take place at an appropriate scale.

An increased use of biochemical and molecular techniques for germplasm characterization is also called for.

Utilization

There is a general feeling in Europe that special efforts have to be made to facilitate and increase the use of plant genetic resources. Closer/strengthened links between crop genebanks and breeders are seen as an important mechanism to achieve this. Many countries perceive the need for increased collaboration in the evaluation of genetic resources. It is felt that improving the documentation about accessions and the accessibility of these data can be an important step to facilitate use. For large collections, the establishment of core collections is mentioned as a tool to facilitate access to the wider diversity in collections.

Documentation

Among the specific tasks, germplasm documentation has been mentioned by the largest number of countries as needing special attention. This included the development of inventories of genetic resources existing in a country in order to identify gaps and unduplicated material. The development of efficient documentation systems at a national level and the harmonization of documentation system at a regional level is also needed.

Research and training

The science of plant genetic resources conservation and use is still in its infancy for several aspects and research is needed to answer many remaining questions. In almost all aspects of PGR conservation and use, areas have been identified which need to be further researched.

Training in areas relevant to genetic resources is also perceived as a priority. The capacity to provide training at all levels, from technical skill training to post-graduate training, needs to be addressed.

Several countries, mainly in newly independent countries and in eastern Europe, have indicated a need to get support for training abroad.

2. Opportunities

Many countries have underlined the importance of international solidarity in the area of PGR. Europe has a lot to offer in the area of training and research.

Partnerships involving European countries, developing countries and international institutes are seen as desirable options for a collaboration which would facilitate transfer of technology and/or technical assistance to developing countries.

In Europe, regional collaboration started a long time ago and networking has proven to be an effective mechanism to initiate a division of the task of PGR conservation.

The European Cooperative Programme for Crop Genetic Resources Networks (ECP/GR) and, more recently, the European Forest Genetic Resources Programme (EUFORGEN) are perceived as important mechanisms of collaboration which have allowed to bring together countries from eastern and western Europe as early as 1980 in the case of ECP/GR.

A few countries mentioned opportunities for training for scientists/students from other countries, specially from developing countries.

Some offers have also been made for exchange of knowledge in the area of plant breeding among countries with similar climatic conditions.

Many countries have indicated their support for the implementation of farmers rights. This will require the establishment of a funding mechanism which would allow to contribute to the conservation effort in developing countries.

Appendixes

Table 2. List of the countries participating in various regional cooperative programmes on genetic resources

| Country | ECP/GR ¹ | ESCORENA ² | EUFOR-GEN ³ | WANA-NET ⁴ | NGB ⁵ | EC 1467/94 ⁶ |
|--------------|---------------------|-----------------------|------------------------|-----------------------|------------------|-------------------------|
| Albania | | yes | | | | |
| Austria | yes | yes | yes | | | yes |
| Belgium | yes | yes | yes | | | yes |
| Belarus | | yes | yes | | | |
| Bulgaria | yes | yes | | | | |
| Croatia | yes | yes | yes | | | |
| Cyprus | yes | yes | | yes | | |
| Czech Rep. | yes | yes | yes | | | |
| Denmark | yes | yes | yes | | yes | yes |
| Estonia | | yes | | | | |
| Finland | yes | yes | yes | | yes | yes |
| France | yes | yes | yes | | | yes |
| Germany | yes | yes | intended | | | yes |
| Greece | yes | yes | intended | | | yes |
| Hungary | yes | yes | intended | | | |
| Iceland | yes | yes | intended | | yes | |
| Ireland | yes | yes | | | | yes |
| Israel | yes | yes | intended | | | |
| Italy | yes | yes | yes | | | yes |
| Latvia | | yes | yes | | | |
| Lithuania | yes | yes | yes | | | |
| F.Y.R | | yes | | | | |
| Macedonia | | | | | | |
| Malta | | yes | yes | | | |
| Moldova | | yes | yes | | | |
| Monaco | | | yes | | | |
| Netherlands | yes | yes | yes | | | yes |
| Norway | yes | yes | yes | | yes | yes |
| Poland | yes | yes | yes | | | |
| Portugal | yes | yes | yes | | | yes |
| Romania | yes | yes | | | | |
| Russian Fed. | yes | yes | | | | |
| Slovakia | yes | yes | yes | | | |
| Spain | yes | yes | intended | | | yes |
| Sweden | yes | yes | yes | | yes | yes |
| Switzerland | yes | yes | yes | | | |
| Turkey | yes | yes | intended | yes | | |
| Ukraine | | yes | yes | | | |
| UK | yes | yes | | | | yes |
| Yugoslavia | intended | yes | | | | |

¹ European Cooperative Programme for Crop Genetic Resources Networks (Phase V) - IPGRI coordinated.

² European System of Cooperative Research Networks in Agriculture - FAO coordinated.

³ European Forestry Genetic Resources Programme (Phase I) - IPGRI coordinated.

⁴ West Asia and North Africa Network on Genetic Resources - IPGRI coordinated.

⁵ Nordic Gene Bank - Institution of the Nordic Council of Ministers.

⁶ European Union Programme for Conservation, Characterization, Collection and Utilization in Agriculture, coordinated by the European Commission Directorate General for Agriculture.

Table 3. Base collections of seed crops located in Europe having entered into agreements with IPGRI (then IBPGR) for the long-term conservation of crop gene pools on regional or global basis⁷

| Institute | Crop | Conservation area |
|--|--|--|
| Jardin Botanic National de Belgique, Meise, Belgium | Wild <i>Phaseolus</i> | Global |
| | Wild <i>Vigna</i> | Global |
| Research Institute for Crop Production, Prague, Czech Republic | Sunflower | Regional: Europe + Medit. |
| INRA - CIRAD, Corsica, France | <i>Allium</i> | Global (field genebank) |
| CIRAD-CA, Département des cultures annuelles, 34032 Montpellier Cedex 1, France | <i>Citrus</i> and related species | Regional: Africa + Medit. (field genebank) |
| | <i>Gossypium</i> spp. | Global |
| Institut fuer Pflanzenzuechtung und Kulturpflanzenforschung Gatersleben, Germany | <i>Lycopersicon</i> | Global |
| | <i>Lupinus</i> | Global |
| Institut fuer Pflanzenbau (FAL), Braunschweig - Voelkenode, Germany | <i>Avena</i> spp. | Global |
| | <i>Beta</i> spp. | Global |
| | <i>Brassica carinata</i> , <i>B. campestris</i> , <i>B. juncea</i> , <i>B. napus</i> | Global |
| | <i>Sinapis</i> spp. | |
| | <i>Phaseolus</i> spp. | Regional: Europe |
| Greek Gene Bank, Tessaloniki, Greece | Cotton | Regional: S. Europe-Medit. |
| | Tobacco | Regional: S. Europe-Medit. |
| | <i>Beta</i> spp. | Regional: S. Europe-Medit. |
| Institut for Agrobotany (RCA), Tapioszele, Hungary | <i>Allium cepa</i> | Regional: S.+ E. Europe |
| | <i>A. ampeloprasum</i> | Regional: S.+ E. Europe |
| Germplasm Institute (CNR), Bari, Italy | Wheats | Global |
| Centre for Genetic Resources, The Netherlands (CGN), Wageningen, The Netherlands | Lettuce | Global |
| | <i>Allium cepa</i> | Global |
| | <i>A. ampeloprasum</i> | Global |
| | Wild <i>Allium</i> spp. | Global |
| | <i>Capsicum</i> spp. | Global |
| | <i>Brassica oleracea</i> | Global |
| | <i>Solanum melongena</i> | Global |
| Polish Gene Bank, Radzikow, Poland | <i>Pisum</i> spp. | Regional: Cent. & E. Europe |
| | Rye | Global |

⁷ After the decision of the FAO Commission on Plant Genetic Resources to establish an International Network of *Ex-Situ* Base Collections under the auspices of FAO as foreseen by the International Undertaking, IPGRI has agreed not to enter into new agreements with collection holders but encouraged these to include their collections in the abovementioned International Network.

| Institute | Crop | Conservation area |
|--|--|--------------------------------------|
| Portuguese Gene Bank, Braga, Portugal | Maize | Regional: S. Europe |
| Universidad Politecnica, Madrid, Spain | Wild relatives of cruciferous crops | Global |
| INIA, Madrid, Spain | <i>Citrus</i> & wild species | Regional: Medit. (field genebank) |
| | <i>Cucumis</i> | Global |
| | <i>Citrullus</i> | Global |
| Nordic Gene Bank (NGB), Alnarp, Sweden | <i>Pisum</i> | Global |
| | <i>Hordeum</i> | Regional-European |
| | <i>Avena</i> | Global |
| | <i>Secale</i> | Global |
| | <i>Beta</i> | |
| Royal Botanic Garden (RBG), Kew, United Kingdom | Woody species (of interest for fuel wood and environmental stability in arid areas) | Global: (Arid zones) |
| | <i>Neonotonia</i> | Regional: African |
| | <i>Trifolium</i> | Regional: African |
| | <i>Cenchrus</i> | Global |
| | <i>Digitaria</i> | Global |
| | <i>Lotononis</i> | Global |
| Horticulture Research International (HRI), Wellesbourne, United Kingdom | Carrot | Global |
| | <i>Brassica oleracea</i> | Global |
| | <i>B campestris</i> | Global |
| | <i>B. juncea</i> | Global |
| | <i>B. napus</i> | Global |
| | <i>Raphanus</i> spp. | Global |
| | <i>Allium</i> spp. | Global |
| | <i>Beta</i> spp. | Global |
| | | Regional: European |
| N.I. Vavilov Institute of Plant Industry (VIR), St. Petersburg, Russia | Maize | Regional: European |
| | <i>Cucurbita</i> | Global |
| | <i>Triticum</i> | Global |
| | <i>Cucumis</i> | Global |
| | <i>Citrullus</i> | Global |

Table 1. List of countries concerned by the European Synthesis and indication of their membership or accession to various Commissions and International Agreements (NB: The Rio agreements, Agenda 21, the Rio Declaration on Environment and Development, and the statement on forest principles were adopted by consensus by the United Nation Assembly and thus by the whole organization)

| Country | Pledges to GEF ¹ status July 1995 (SDR ² mio.) | Signed the COB ³ | Ratified the COB | Member of FAO ⁴ since | Member of CPGR ⁵ | Signed the IU ⁶ | FAO Internat. <i>ex situ</i> network ⁷ | Member of CGIAR |
|---------------------------|--|--------------------------------|---------------------|-------------------------------------|--------------------------------|-------------------------------|---|--------------------|
| Albania | – | signed | 05.01.94 | 21.11.73 | yes | | | |
| Armenia | – | 13.06.92 | 14.05.93 | 08.11.93 | | | | |
| Austria | 14.28 | 13.06.92 | 18.08.94 | 27.08.47 | yes | yes | | yes |
| Belarus | – | 11.06.92 | 08.09.93 | – | | | | |
| Belgium | – | 05.06.92 | – | 16.10.45 | yes | yes | | yes |
| Bosnia and Herzegovina | – | – | – | 08.11.93 | | | | |
| Bulgaria | – | 12.06.92 | – | 06.11.67 | yes | yes | | |
| Croatia | – | 11.06.92 | – | 08.11.93 | yes | | | |
| Cyprus | – | 12.06.92 | – | 14.09.60 | yes | yes | | |
| Czech Rep. | 4.00 | 04.06.93 | 03.12.93 | 08.11.93 | yes | yes | yes | |
| Denmark | 25.08 | 12.06.92 | 21.12.93 | 16.10.45 | yes | yes | yes | yes |
| Estonia | – | 12.06.92 | 27.07.94 | 11.11.91 | yes | | | |
| European Union | – | | | | yes | | | |
| Finland | 15.45 | 05.06.92 | 27.07.94 | 27.08.47 | yes | yes | yes | yes |
| France | 102.26 | 13.06.92 | 01.07.94 | 16.10.45 | yes | yes | yes | yes |
| Georgia | – | signed | 12.06.94 | – | | | | |
| Germany | 171.30 | 12.06.92 | 21.12.93 | 27.11.50 | yes | yes | yes | yes |
| Greece | 3.57 | 12.06.92 | 04.08.94 | 16.10.45 | yes | yes | | |

¹ Global Environmental Facility

² Special Drawing Rights (US\$ 1.4010 = SDR 1)

³ Convention on Biological Diversity

⁴ Food and Agriculture Organization of the United Nations

⁵ FAO Commission on Plant Genetic Resources

⁶ International Undertaking on Plant Genetic Resources

⁷ Countries having indicated their willingness to make their genebanks part of the International Network of *Ex-Situ* collections under the auspices of FAO.

| Country | Pledges to GEF ¹ status July 1995 (SDR ² mio.) | Signed the COB ³ | Ratified the COB | Member of FAO ⁴ since | Member of CPGR ⁵ | Signed the IU ⁶ | FAO Internat. <i>ex situ</i> network ⁷ | Member of CGIAR |
|---------------------|--|--------------------------------|---------------------|-------------------------------------|--------------------------------|-------------------------------|---|--------------------|
| Hungary | – | 13.06.92 | 24.08.94 | 06.11.67 | yes | yes | | |
| Iceland | – | 10.06.92 | 12.09.94 | 16.10.45 | yes | yes | | |
| Ireland | 1.71 | 13.06.92 | – | 03.09.46 | yes | yes | | yes |
| Israel | – | 11.06.92 | – | 23.11.49 | yes | yes | | yes |
| Italy | 81.86 | 05.06.92 | 15.04.94 | 16.09.46 | yes | yes | yes | |
| Latvia | – | 11.06.92 | – | 11.11.91 | yes | | | |
| Liechten-stein | – | 05.06.92 | – | – | | yes | | |
| Lithuania | – | 11.06.92 | – | 11.11.91 | yes | | | yes |
| Luxembourg | – | 09.06.92 | 09.05.94 | 16.10.45 | | | | |
| FYR of Macedonia | – | – | – | 08.11.93 | | | | |
| Malta | – | 12.06.92 | – | 05.10.64 | yes | | | |
| Moldova | – | 05.06.92 | – | – | | | | |
| Monaco | – | 11.06.92 | 20.11.92 | – | | | | |
| Netherlands | 50.97 | 05.06.92 | 12.07.94 | 16.10.45 | yes | yes | yes | yes |
| Norway | 22.29 | 09.06.92 | 09.07.93 | 16.10.45 | yes | yes | yes | yes |
| Poland | – | 05.06.92 | – | 09.11.57 | yes | yes | | |
| Portugal | 4.00 | 13.06.92 | 21.12.93 | 11.09.46 | yes | yes | | |
| Romania | – | 05.06.92 | 17.8.94 | 09.11.61 | yes | yes | | yes |
| Russian Fed. | – | 13.06.92 | 05.04.95 | – | yes | yes | yes | yes |
| Slovakia | 4.00 | 19.05.93 | 25.08.94 | 08.11.93 | yes | | | |
| Slovenia | – | 13.06.92 | – | 08.11.93 | | | | |
| Spain | 12.36 | 13.06.92 | 21.12.93 | 05.04.51 | yes | yes | yes | yes |
| Sweden | 41.60 | 08.06.92 | 16.12.93 | 13.2.50 | yes | yes | yes | yes |
| Switzerland | 31.96 | 12.06.92 | 21.11.94 | 11.09.46 | yes | yes | yes | yes |
| Turkey | 4.00 | 11.06.92 | – | 06.04.48 | yes | yes | | |
| Ukraine | – | 11.06.92 | 09.02.95 | – | | | | |
| UK | 96.04 | 12.06.92 | 03.06.94 | 16.10.45 | yes | yes | yes | yes |
| F.R.Yugoslavia | – | 08.06.92 | – | 16.10.45 | yes | yes | | |

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Report of the Regional Preparatory Meeting for Europe

Nitra, Slovakia, 24 - 27 September, 1995

Part II. Report of the Preparatory Meeting for Europe

24-27 September 1995, Nitra, Slovakia



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Introduction

Opening ceremony

Representatives from 35 countries (see list of delegations in Appendix) met in Nitra, Slovakia from 24-27 September 1995. Representatives from 5 NGOs as well as FAO, the EC and IPGRI also attended the meeting.

The meeting was opened by Mr Vincent Bíroš on behalf of the Ministry of Agriculture of the Slovak Republic, who welcomed the delegates, expressed his satisfaction at hosting this important meeting and wished all a successful meeting.

Mr Cary Fowler then addressed the delegates on behalf of FAO. He explained that this meeting was the sixth to be held in a series of eleven regional and subregional meetings as part of the preparatory process to the FAO Fourth International Technical Conference on Plant Genetic Resources.

Mr Dick van Sloten greeted the delegates on behalf of the Director General of the International Plant Genetic Resources Institute (IPGRI). He emphasized the strong involvement of IPGRI, and particularly that of IPGRI's Europe Group, in the preparatory process of the Fourth Technical Conference on Plant Genetic Resources.

Procedural matters

Mr Michel Chauvet of France was elected to chair the meeting and Mr Ladislav Dotlacil from the Czech Republic was elected as Vice-Chair. Mr Gert Kleijer from Switzerland was elected as rapporteur. The agenda (Appendix I) was adopted by the meeting.

Overview of the Fourth International Technical Conference on Plant Genetic Resources and its Preparatory Process

Mr Cary Fowler of FAO gave an overview of the process leading to the Fourth Technical Conference on Plant Genetic Resources. He described the two documents which should result from this process and which will be submitted to the Conference in Leipzig in June 1996, namely the Report on the State of the World's Plant Genetic Resources and the Global Plan of Action for the Conservation and Sustainable Use of Plant Genetic Resources (GPA).

He noted the participatory nature of the preparatory process which included the submission of country reports and the holding of subregional meetings. Both are important inputs into the two major documents for the International Technical Conference. These documents will be negotiated by the Commission on Plant Genetic Resources and adopted by the International Technical Conference. Mr. Fowler explained that this effort was within the context of the FAO Global System on Plant Genetic Resources.

Mr Fowler stressed that the main purposes of the meeting were to review the situation in the region, examine common problems and opportunities, develop positions and recommendations for the Global Plan of Action and forge consensus. In addition, he observed that many delegates wished to extend the progress made in the ECP/GR meeting as a contribution to the International Technical Conference. He noted that IPGRI had prepared a very useful draft regional synthesis report as a background for discussions, though this report did not necessarily represent the views of FAO on substantive matters or regarding any government or the definition of the territory of any country.

Mr Fowler stated that discussions during this meeting could cover the entire range of subjects from conservation to utilization and that plant genetic resources for food and agriculture, including forest genetic resources, were under consideration. While the region itself was the focus of the meeting, global considerations should be kept in mind. Concrete, pragmatic recommendations were solicited, for example on rationalization of collections, regeneration, characterization and evaluation, utilization and capacity building. In addition, guidance was sought on the nature of responsibilities at the national, regional and international levels.

The host country was thanked again for its generosity. The assistance of IPGRI was cited with appreciation. Their contribution to the preparation and holding of the meeting was essential to the success of the effort.

Presentation of Regional Collaborative Programmes on Plant Genetic Resources

European Cooperative Programme for Crop Genetic Resources Networks (ECP/GR)

ECP/GR was presented by Mr Gert Kleijer from Switzerland, Chairman of the mid-phase meeting of the Technical Consultative Committee (TCC) in Nitra, 21-23 September 1995. After an introduction on the programme's history and the successes obtained by its working groups, Mr Kleijer presented the new operational structure of ECP/GR as adopted by the TCC during its meeting. The TCC recommended that ECP/GR be used as the platform for the implementation of the GPA in the European Region as part of the FAO Global System on Plant Genetic Resources. The structure of ECP/GR was subsequently modified after adoption by the Programme's Steering Committee on 25/9/95. The final structure and recommendations of the TCC are shown in Appendix II. A summary on ECP/GR is attached as Appendix III.

European Forest Genetic Resources Programme (EUFORGEN)

Mr Jozef Turok, EUFORGEN Coordinator, presented this programme recently established in application of the Resolution 2 of the Ministerial Conference for the Protection of Forests in Europe held in Strasbourg in 1990 and the Ministerial Conference held in Helsinki in 1993. Twenty-two countries are currently members of EUFORGEN and a further eight have expressed strong interest in joining the Programme.

The programme is managed by IPGRI in consultation with FAO, and is overseen by a Steering Committee consisting of the National Coordinators nominated by the Programme's member countries. Mr Turok went on to present the four existing Networks within the Programme and highlighted the activities currently ongoing. He further stressed the importance of forest genetic resources and drew attention to specific problems with their conservation and sustainable use. A summary on EUFORGEN is attached as Appendix IV.

European System of Cooperative Research Networks in Agriculture (ESCORENA)

Mr J. Serwinski of the FAO Seed and Plant Genetic Resources Service presented the activities of the European System of Cooperative Research Networks in Agriculture (ESCORENA) which was established in 1974 under the auspices of FAO. He introduced the main objectives of the system and listed research networks dealing with plants. Working groups with an element of plant genetic resources were highlighted. A presentation on ESCORENA is attached as Appendix V.

The European Union (EU) as Partner in the Regional Collaboration on Plant Genetic Resources

Mr J.M. Bolivar of Spain gave a reading of the suggestions and conclusions by the EU and its member states as well as proposals for the GPA. This document addresses the aims of the GPA, a strategy to achieve these aims and policies and actions. The document is attached as Appendix VI.

Mr Richard Hardwick of the European Commission then presented an overview of the current legislation of the EU in the area of plant genetic resources. The EU Programme on genetic resources (EC) 1467/94 particularly addresses the conservation of *ex situ* collections. A first call for proposals was published in December 1994 and the results of the selection process are expected before the end of 1995. The representative of the Commission stated that 'A preliminary list of European Union legislation in the Area of Plant Genetic Resources' was available for distribution to the delegates. This explained the various modalities of support provided under European legislation for the conservation, characterization, collection and utilization of genetic resources in agriculture. This paper is attached as Appendix VII of this report.

Presentation of the Draft Regional Synthesis Report

Mr Emile Frison, Europe Regional Director of IPGRI, presented the Draft Regional Synthesis Report prepared by IPGRI for the Regional Meeting on Plant Genetic Resources.

The meeting commended IPGRI and the secretariat for the quality of the report and is satisfied that the content represents a good synthesis of the information included in the Country Reports. No attempt was made by the meeting to reach a consensus on every element of the document but the secretariat accepted to take into account minor modifications suggested by the different countries. The meeting agreed to replace the recommendations for the GPA included in the draft report by those adopted by the meeting in the last Plenary session. The meeting commended the report to the attention of the secretariat as a working document for the preparation of the Report on the State of the World's Plant Genetic Resources. The Synthesis Report is annexed to this report.

Recommendations for the Global Plan of Action

Context and principles

Recognizing:

- that international cooperation and collaboration is essential to the success of the GPA which is an integral part of the FAO Global System for plant genetic resources;
- the willingness for increased international collaboration present at national level;
- that actions within the GPA must contribute to develop and strengthen this collaboration, and
- that the measures decided in the GPA should be in harmony with the objectives formulated in Chapter 14G of Agenda 21 and comply with the provisions of the Convention on Biological Diversity and other relevant international agreements,

and taking into consideration:

- the specific characteristics of plant genetic resources for food and agriculture (PGRFA) which are fundamental for food security, and the great interdependence of countries with regard to PGRFA,

the Meeting encourages the establishment of a multilateral agreement for plant genetic resources for food and agriculture, and recommends:

- that this multilateral agreement include both material collected prior to the coming into force of the Convention on Biological Diversity and material collected thereafter;
- that this multilateral agreement include in principle all plant genetic resources for food and agriculture;
- that this multilateral agreement ensure unrestricted access to the plant genetic resources covered by the agreement, to all members to the agreement, and
- that this multilateral agreement encourage the involvement of the private sector and NGOs.

That with the view to implementing the GPA, the multilateral agreement resulting from the negotiated revision of the International Undertaking include inter alia, and in harmony with other relevant international agreements, the following elements:

- an information network or system, including an inventory of genetic resources, promoting information exchange on material designated to the multilateral agreement, and a multilateral framework to support the strengthening of technical capacity and to implement programmes which would ensure a fair and equitable sharing of benefits derived from PGRFA, contributing, inter alia, to the realization of Farmers Rights.

The Meeting also recommends:

- that the FAO global system help facilitate unrestricted access to genetic material for bona fide users for research and breeding purposes;
- that a mechanism be established by which the implementation of national, regional and global components to a Global Plan of Action can be monitored by governments;

- that the institutes which have signed agreements with IPGRI (formerly IBPGR) making commitments for the unrestricted availability and the long-term conservation of collections designated under the previously called “IBPGR Register of Base Collections” place those collections under the auspices of FAO in the international Network of *ex situ* Collections;
- that the International Network of *ex situ* Collections under the auspices of FAO be further developed;
- that existing global initiatives which relate to the conservation and use of genetic resources for food and agriculture (taken by FAO, UNEP, UNDP, UNESCO, CGIAR, IUFRO, etc.) be coordinated on an objective-orientated basis and implemented in close collaboration within the context of the FAO Global System on PGR and in harmony with the Convention on Biological Diversity;
- that in the field of conservation and sustainable use of plant genetic resources, existing policy areas be better coordinated and the efficiency of existing and new global instruments improved, and
- that public awareness about genetic resources be further promoted at all levels and with all relevant parties.

National programmes

National commitment to conservation of PGRFA

Recognizing:

- the obligation of countries under the Convention on Biological Diversity to reflect adequately through coherent national policies their commitment to the long-term conservation of plant genetic resources;
- that national plant genetic resources programmes are the basic building blocks of any international effort in this field;
- the utmost importance of long-term national commitment to genetic resources programmes, in particular, for the conservation and sustainable use of plant genetic resources for food and agriculture;
- that national collections should contain the genetic resources required to meet national needs and international obligations, and that they may focus in particular on indigenous resources;
- the value of regional and international collaboration;
- that international and regional organizations derive their mandates from national governments;
- that the availability of new funds is likely to be limited, and
- the urgent need to translate commitment into practical action;

the Meeting recommends:

- that countries establish national programmes for the conservation and sustainable use of plant genetic resources that include all relevant partners from relevant ministries, research institutes, universities, the private sector and NGOs;
- that countries take steps as appropriate to ensure that national programmes rest on an adequate legal basis, consistent with relevant international agreements, and on appropriate policy and institutional framework in which clear responsibilities are assigned to relevant ministries and institutions;

- that coordination mechanisms within countries, inter alia, between relevant ministries, be adequate to ensure the most effective prioritization in the deployment of financial and other resources;
- that coordination mechanisms at operational level be effective in avoiding duplication and promoting a coherent effort;
- that opportunities be taken for collaboration among countries in order to avoid unnecessary duplication of holdings and efforts;
- that in organizing systems of conservation at national, regional and international levels, the differing *ex situ* conservation requirements of seed-propagated and vegetatively propagated crops, and the different strategies necessary for forestry resources (*in situ* conservation), be all taken into account;
- that opportunities be taken to raise public awareness as a means of ensuring that the importance of plant genetic resources conservation is adequately recognized in the national political process;
- that international organizations work with governments to develop the practical measures by which countries implement their international commitments, and
- that coordinated and prioritized action at national level be complemented by an international system that is likewise coordinated and prioritized.

Collaboration between public and private sector

Regarding the collaboration between the public and the private sector to ensure the long-term conservation and use of plant genetic resources,

the Meeting recommends:

- the active collaboration between all parties concerned with the conservation and use of plant genetic resources;
- that adequate public safeguard be maintained over the collections which are held in collaboration with bodies outside the public sector, particularly in countries with economies in transition;
- that primary characterization, evaluation and adequate documentation be considered as essential to facilitate collaboration with plant breeders and promote the sustainable use of plant genetic resources;
- that the status of collections held by countries should be defined and a clear commitment for long-term conservation formulated for those collections considered as national genetic resources, and
- that all countries hold inventories of their plant genetic resources conserved *in situ* or *ex situ*.

Privatization of public collections

Concerning privatization, the meeting expresses its concern at the increasing privatization of public plant genetic resources collections.

The Meeting recommends:

- that privatization initiatives, if considered, take account of the country's long-term commitment to conserve plant genetic resources, and that this commitment be supported by an adequate national policy framework, and
- that in forestry, in particular, recognizing the long life cycles of forest trees and the need to secure the long-term conservation of genetic resources (including those in private forest stands) in countries with economies in transition, adequate consideration be given to the need for legal and financial support of the national

programmes and that capacity-building programmes be envisaged for new forest owners.

Collaboration with NGOs

Recognizing:

- the role of NGOs and other actors in the informal sector in the implementation of programmes in conservation and utilization of plant genetic resources for food and agriculture, research, advocacy and public information at local, national, regional and international levels, and
- that the collaboration with NGOs already involved in the area is essential to the success of programmes concerned with on farm conservation at regional and community level,

the Meeting recommends:

- that both NGOs and the formal sector work towards improving the benefits of collaboration, and
- that the needs of, and opportunities of working with, NGOs be properly identified, and concrete actions be developed, particularly in the areas of training, access to reproductive material, national coordination of local initiatives, information, public awareness and assessing legal constraints to collaboration.

Regional and subregional collaboration

European Cooperative Programme for Crop Genetic Resources Networks

Recognizing:

- the role played by the European Cooperative Programme for Crop Genetic Resources Networks (ECP/GR), for the last 15 years, in developing a pan-European collaboration on plant genetic resources;
- the experience gained in coordinating collaborative efforts in a cost-effective way;
- the significant results obtained by the Programme;
- the entry into force of the Convention on Biological Diversity and the adoption by many European countries of Agenda 21;
- the existence of various national, bilateral and regional activities in the European region;
- the importance of international, regional and bilateral cooperation in the area of plant genetic resources, and
- the potential role of ECP/GR in implementing the Global Plan of Action in the European region as part of the FAO Global System on Plant Genetic Resources,

and considering that the objectives of ECP/GR are:

- first and foremost, to ensure the long-term conservation and to facilitate and encourage the increased utilization of plant genetic resources in Europe,
- to increase the planning of joint activities,
- to strengthen links between east and west European plant genetic resources programmes,
- to develop joint project proposals to be submitted to funding agencies,

- to contribute to monitoring the safety of plant genetic resources collections and take appropriate action when required, and
- to increase public awareness at all levels of the importance of plant genetic resources activities;

(33) also considering:

- that the operational structure of ECP/GR is as described in Figures 1 and 2 of Appendix II;
- that the Programme is overseen by a Steering Committee which has the following function:
 - * it has overall responsibility for the Programme, approving its budget and providing technical and policy guidance to the Programme,
 - * it takes decisions regarding the general scope of the networks and the establishment or termination of working groups,
 - * it provides guidelines for and approves *ad hoc* activities,
 - * it mandates the Coordinating Secretariat to carry out decisions of the Steering Committee and reviews the progress made by the networks, and
 - * it can also make recommendations regarding *ad hoc* activities which are funded from other sources;
- that the proposed framework does not imply a commitment by countries to fund activities which could be included in the framework;

the Meeting recommends:

- that the European Cooperative Programme for Crop Genetic Resources Networks, the basis of which are active national programmes, be used as the platform to facilitate the implementation of the Global Plan of Action for the European region as part of the FAO Global System on Plant Genetic Resources;
- that, within the regional cooperative structure, **priorities** be given to:
 - * crops having their primary or secondary centre of diversity within the region,
 - * crops of high economic importance to the region,
 - * crops which are highly threatened by genetic erosion, and
 - * crops for which the efficiency of conservation management could be increased and overall cost reduced by collaboration;
- that representatives of the EC and the MAB-Programme be invited to the Steering Committee of ECP/GR as full members and that ASSINSEL be invited as an observing member;
- that activities on forestry be not, for the time being, included in the ECP/GR structure. EUFORGEN should provide this structure. Strong links between the two structures should be established;
- that, in addition to existing bilateral and subregional activities, additional subregional activities be encouraged, and
- that, in addition to existing links with NGOs and breeders, a closer collaboration at a regional level be encouraged; and
- that priorities for funding proposals by other bodies such as the EU be encouraged to complement and add value to the activities of ECP/GR.

Subregional collaboration

The Meeting recommends:

- to formalize and strengthen subregional cooperation, such as that between the Nordic Gene Bank and the Baltic countries;

- that initiatives to rationalize conservation, characterization and evaluation and to share responsibilities for these activities be encouraged. They could have a crop-specific focus (European field collections of *Allium* in the Czech Republic and in Israel, Dutch-German Agreement on plant genetic resources, etc.) or a regional or subregional focus (Nordic Gene Bank, Middle East Regional Genebank Endeavor - MERGE), and
- that significant elements of the work related to primary characterization and pre-breeding activities be carried out within the framework of regional or subregional collaboration as they are seen as a public sector service to be carried out in close collaboration with the genebanks and breeders.

Complementarity between in situ and ex situ conservation

Recognizing:

- that conservation and use of plant genetic resources *in situ*, on-farm and *ex situ* should be seen as complementary and an integral part of national and regional strategies;
- that there is still a need for collecting of endangered wild relatives of crops and landraces, and
- that many wild plants are gathered for food and that their conservation needs, *in situ* and *ex situ*, are inadequately addressed in current programmes;
- that seed trade legislations are sometimes antagonist with the conservation of genetic diversity, *in* or *ex situ*;

the Meeting recommends:

- that a stronger collaboration on the conservation and sustainable use of wild plants be undertaken in the framework of international collaborative programmes on plant genetic resources;
- that improved mechanisms for ensuring coordination and closer collaboration among responsible institutions be established;
- that *in situ* conservation of wild relatives of crops be promoted through national, regional and international cooperation and funded according to needs and priorities, particularly in countries in which high levels of diversity are found;
- that the establishment of *in situ* networks be considered at the European level;
- that regional cooperative programmes to promote *in situ* conservation be encouraged. These should focus on ecogeographic sub-regions such as the Alps, the Carpatian region, the Balkans and the Mediterranean basin;
- that the need for collecting of endangered wild relatives of crops and landraces be addressed through regional collaboration;
- that regional policies such as the EU legislation on marginal agricultural areas or the legislation on seed trade be reviewed to evaluate their effects on PGR conservation and use, and where appropriate adapted to specifically promote on farm conservation in diversity rich areas, and
- that appropriate measures be taken to conserve varieties that are no longer available commercially.

Underutilized species

Recognizing:

- the importance of underutilized species in Europe, in particular, indigenous species and their potential to contribute to agricultural and diet diversification, and

- the experience gained by IPGRI's project on Underutilized Mediterranean Species (UMS),

the Meeting recommends:

- that as a first step, an inventory of underutilized species of Europe be established, which should contain the following information:
 - * a list of underutilized species, their distribution throughout the region and the level of utilization at local or subregional level,
 - * the status of availability of germplasm in genebank collections,
 - * an indication of the level of genetic erosion of the species,
 - * a list of experts/institutions working on these species,
 - * a list of on-going activities on these species, and
 - * a list of relevant publications.
- * that actions be undertaken to select from the inventory those species which are most threatened and to ensure that they are included in the lists of endangered species of those countries where the threat is reported to occur;
- * that threatened species requiring emergency collecting and/or *in situ* conservation in protected areas be identified;
- * that the project on Underutilized Mediterranean Species (UMS) be considered as a model for the establishment of new subregional cooperations for the conservation and sustainable use of underutilized species, including research when appropriate, and
- * that coordination mechanisms between existing institutes and initiatives on underutilized species, such as UMS, the neglected crop species project of IPGRI/IPK Gatersleben, ICUC, etc. be improved.

Inventory of plant genetic resources for food and agriculture

The Meeting recommends:

- that a broad inventory of plant genetic resources conserved *ex situ* and *in situ*, be established and regularly updated;
- that new information technologies be used to provide better access to information about collections to potential users and to decision-makers, and
- that integrated information systems be developed to promote complementarity and standardization of characterization and evaluation data of *ex situ*, *in situ* and on-farm conserved plant genetic resources.

Research and training

Recognizing:

- the importance of research and training in the field of conservation and sustainable use of PGRFA;

the Meeting recommends:

- that research programmes dealing with the following aspects be given priority in allocation of international funds:
 - * storage and regeneration methods, particularly for non-orthodox seed,
 - * possible impact of legal, economic and agricultural policy on plant genetic resources and biodiversity,
 - * exploration and documentation of still existing knowledge, innovations and practices of indigenous and local communities about plant genetic resources,

- * identification and promotion of underutilized crops with potential economic importance, and
- * development of methods for the assessment of the structure and evolution of genetic diversity, under natural and artificial constraints.
- that capacity building and training in the area of plant genetic resources conservation and sustainable use be further developed at all levels, from technical skills to post-graduate training.

International collaboration

Recognizing:

- that the conservation and sustainable use of plant genetic resources in developing countries should be promoted through development cooperation, and
- the commitment of parties to the Convention on Biological Diversity to increased international technical cooperation;

the Meeting recommends:

- that appropriate programmes, projects and activities be undertaken on a global level in the areas of:
 - * training,
 - * technology transfer,
 - * knowledge, innovations and practices of indigenous and local communities,
 - * policy coordination and coordination on a technical level,
 - * research, and
 - * the rationalization of collections;
- that consideration be given, *inter alia*, to the following possibilities:
 - * improvement of capacity-building at regional or national level in other regions, both through the public sector and through other structures,
 - * development of appropriate education, taking account of relevant existing experience and making use of local or regional capacity,
 - * development of a crop information system on knowledge, innovations and practices of indigenous and local communities gathered from relevant people, available to all actors in the field of conservation and sustainable use of PGRFA;
- that more efficient conservation systems and improved utilization of PGRFA be aimed for by making use of synergistic effects of international cooperation;
- that methods to establish core collections for important crops be further developed within the framework of international cooperation;
- that international crop networks for the effective conservation, evaluation and utilization of plant genetic resources be further developed for the most important or potentially significant species, and
- that several countries receive assistance in upgrading their storage facilities and carrying out emergency regeneration, based on the uniqueness of their national collections and the threat they are facing.

Appendix I. Agenda of the Regional Meeting on Plant Genetic Resources (Nitra, 24-27 September 1995)

Saturday 23 September 1995

Arrival of participants

Sunday 24 September 1995

9.30 *Opening of the meeting (plenary session during the whole day)*

Opening ceremony (introductory statements by representatives of the host country, FAO and IPGRI)

Procedural matters (election of officers and adoption of the agenda)

Overview of the 4th International Conference on Plant Genetic Resources and its preparatory process

Presentation of regional collaborative programmes on plant genetic resources (ECP/GR, EUFORGEN)

Presentation of the regional collaborative research programme ESCORENA

The EU as partner in the regional collaboration on plant genetic resources

Presentation and discussion of the Draft Regional Synthesis Report

Modus operandi of the working groups to be held on 25 September

Monday 25 September 1995

08.30 *Beginning of the session (working groups during the whole day)*

Morning

Working group A: National commitment to genetic resources and options for coordination of activities

Working group B: Operational aspects of regional collaboration

Working group C: Integrating in situ and ex situ conservation and use at national and regional levels;

Afternoon

Working group D: Ensuring the long-term conservation and use of PGR in collaboration with the private sector; privatization and its impact on crop and forestry genetic resources activities

Working group E: Options for a multilateral system for plant genetic resources

Working group F: The conservation and promotion of underutilized species

Tuesday 26 September 1995

08.30 *Plenary session*

Reports from the working groups

Implications for a regional input into the Global Plan of Action (ad hoc working groups)

17.00 *Plenary session*

Reports from the ad hoc working groups and discussion

Wednesday 27 September 1995

No session in the morning (drafting of the report)

14.30 *Plenary session*

Adoption of the report, including recommendations for the Global Plan of Action

18.30 *Tentative end of the meeting*

Thursday 28 September 1995

Departure of the delegates

Appendix II. Recommendation made by the Technical Consultative Committee of ECP/GR to the European Meeting on Plant Genetic Resources (Nitra, 24-27 September 1995)

(Revised version as agreed in an extraordinary meeting of the Committee on 25/9/95)

Recognizing:

- the role played by ECP/GR for the last 15 years in developing a pan-European collaboration on plant genetic resources;
- the experience gained in coordinating collaborative efforts in a cost effective way;
- the significant results obtained by the Programme;
- the entry into force of the Convention on Biological Diversity and the adoption by many countries of Agenda 21;
- the existence of various national, bilateral and regional activities in the European region;
- the importance of international, regional and bilateral cooperation in the area of plant genetic resources;
- the potential role of ECP/GR in implementing the Global Plan of Action in the European region as part of the FAO Global System on Plant Genetic Resources;

considering that the objectives of ECP/GR are :

- first and foremost to ensure the long-term conservation and to facilitate and encourage the increased utilization of plant genetic resources in Europe;
- to increase the planning of joint activities;
- to strengthen links between east and west European plant genetic resources programmes;
- to develop joint project proposals to be submitted to funding agencies;
- to contribute to monitoring the safety of plant genetic resources collections and take appropriate action when required;
- to increase public awareness at all levels of the importance of plant genetic resources activities.

also considering that the operational structure of ECP/GR is as described in Figures 1 and 2;

the Committee recommends that the European Cooperative Programme for Crop Genetic Resources Networks, the basis of which is active national programmes, be used as the platform to facilitate the implementation of the Global Plan of Action in the European region as part of the FAO Global System on Plant Genetic Resources.

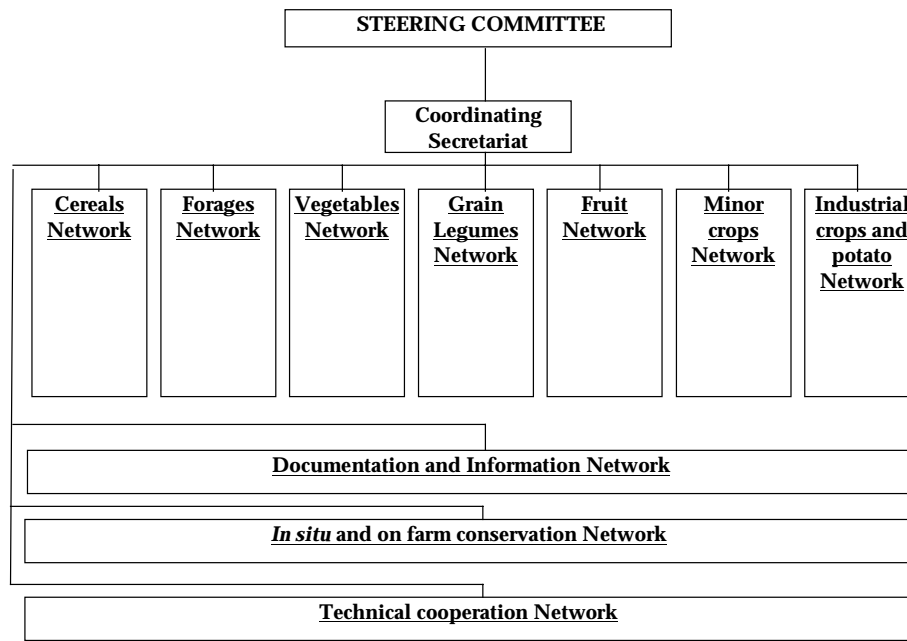


Fig. 1. Operational Structure of ECP/GR

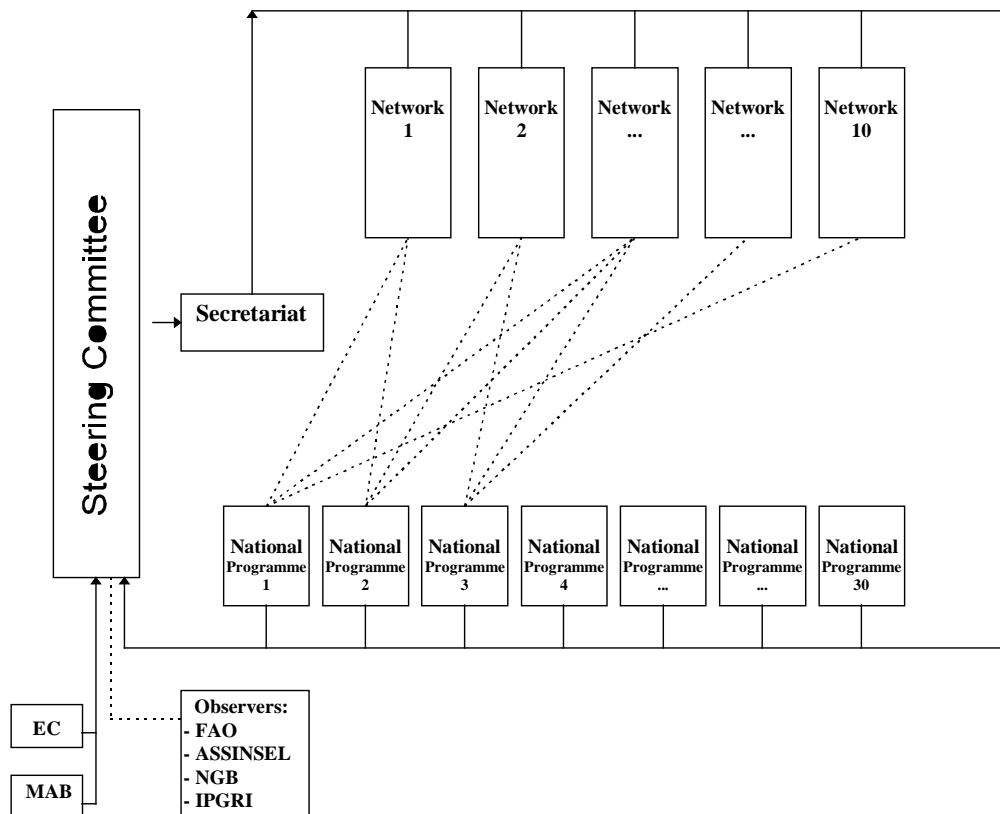


Fig. 2. Interaction of National Programmes with the networks and the Steering Committee of ECP/GR

Appendix III. The European Cooperative Programme for Crop Genetic Resources Networks (ECP/GR)

The European Cooperative Programme for Crop Genetic Resources Networks (ECP/GR)

Introduction

ECP/GR was initiated in 1980 on the recommendations of UNDP, FAO and the EUCARPIA Genebank Committee to promote the conservation and utilization of crop genetic resources. From its establishment, this Programme has focused on strengthening international collaboration between east and west European countries through crop centered working groups in which experts in genetic resources management implement joint activities.

Through Phase I to Phase IV, ECP/GR has played an important role in accelerating the development of national programmes in several countries and has proved to be a valuable forum for the exchange of information, ideas and germplasm both within and beyond Europe. At the end of Phase III, the idea prevailed that the established networks should become independent. Consequently, the coordinator position was reduced to 1/4-time for Phase IV. During this fourth Phase, however, many expressed the wish to see the programme continue under the coordination of IPGRI, in order to maintain the momentum obtained during the first three Phases. The implementation of a fifth Phase (1994 to 1998), including the appointment by IPGRI of a full-time coordinator, was unanimously approved at the meeting of member states' representatives which was held in Bulgaria in August 1993. In September 1995, 30 countries actively participated in ECP/GR.

Objectives

The original objectives of ECP/GR include the creation of a system to facilitate direct contact between institutions involved in crop genetic resources activities. ECP/GR is to promote unhindered exchange of crop genetic resources and related data. Consequently, up-to-date information on collections held by public institutions and private breeders is to be made easily available to users. ECP/GR is also a framework in which joint activities such as collecting expeditions, characterization and evaluation of germplasm are implemented.

The following specific objectives were decided for Phase V of ECP/GR:

- first and foremost to ensure the long-term conservation and to facilitate and encourage the increased utilization of plant genetic resources in Europe;
- to increase the planning of joint activities;
- to strengthen links between east and west European plant genetic resources programmes;
- to develop joint project proposals to be submitted to funding agencies;
- to contribute to monitoring the safety of plant genetic resources collections and take appropriate action when required, and
- to increase public awareness at all levels of the importance of plant genetic resources activities.

Modus operandi

ECP/GR has operated for 15 years on the basis of crop-specific working groups. It was recognized by the Technical Consultative Committee (TCC) meeting on 21-23 September 1995 that this has allowed the establishment of a strong basis for

collaboration throughout Europe, but that regional collaboration needs to be extended beyond a limited number of crops and that ECP/GR should adapt its operational structure to allow activities on other crops or themes to be carried out. To respond to this need for more flexibility a new programme structure was agreed upon.

According to this new structure, ECP/GR is overseen by a Steering Committee (former TCC), consisting of National Coordinators nominated by participating countries. The EC and MAB are invited to nominate a representative as full member of this Committee. FAO, IPGRI, the Nordic Gene Bank and ASSINSEL are invited as observers. The Programme operates through broad networks in which activities are either carried out in the framework of working groups or as *ad hoc* actions.

The Steering Committee has the overall responsibility of the Programme, approves its budget and provides technical and policy guidance to the programme. It takes decisions regarding the general scope of the networks and the establishment or termination of working groups. The Steering Committee provides guidelines for and approves *ad hoc* activities. It mandates the Coordinating Secretariat to carry out decisions of the Steering Committee and reviews the progress made by the networks. The steering committee can also make recommendations regarding *ad hoc* activities which are funded from other sources.

The Coordinating Secretariat is currently provided by IPGRI as appointed by the Steering Committee. The responsibilities of the Coordinating Secretariat are:

- to ensure the implementation of the programme in accordance with the mandate given by the Steering Committee;
- to coordinate the activities carried out in the framework of the programme;
- to be responsible for the financial management of the Programme;
- to provide technical and financial reports to the Steering Committee for approval;
- to provide support to working groups and ensure that the agreed workplans are carried out;
- to initiate *ad hoc* activities in accordance with guidance provided by the Steering Committee;
- to gather and distribute information;
- to assist in the formulation of project proposals for joint activities;
- to search for donors to support particular elements of workplans and *ad hoc* activities;
- to link with other regions, and
- to contribute to raising public awareness.

The networks are broad organizational structures that accommodate different types of activities contributing towards the general objectives of the Programme. The networks are crop or theme oriented. The networks are the structural elements through which progress of the Programme is reported and priorities are set.

The following networks have been established: Cereals network; Forages network; Grain legumes network; Industrial crops and potato network; Vegetables network; Fruits network; Minor crops network; Documentation and information network; *In situ* and on-farm conservation network; Technical cooperation network. The subject matter of networks and their number is reviewed periodically and modified as required.

Working groups focus their activity on specific crops, crop groups or thematic areas. They are initiated following the approval of the Steering Committee.

ECP/GR provides funding for the organization of working group meetings and the publication of the resulting reports. National Coordinators are invited to nominate an Attending or a Corresponding Member to represent the country's interest in the genetic resources activities that the working group focuses on. The working groups are expected to meet once or twice during Phase V of the Programme. The actions carried out by the members of the working groups, for example, the management of European Crop Databases or the hosting of European Collections, are not *a priori* funded by the Programme. They are considered as an input in kind by participating institutions to the European cooperation on plant genetic resources. The continuation of a working group is decided on by the Steering Committee.

Ad hoc actions are initiated by the Secretariat, following the guidance of the Steering Committee. *Ad hoc* actions contribute towards the general objectives of the Programme and are carried out in the framework of the Programmed s networks. *Ad hoc* actions can be *inter alia*: meetings of small groups dealing with specific technical issues or with crops not yet covered by existing working groups; technical symposia dealing with methodological aspects of plant genetic resources conservation; collaborative actions with other international and regional programmes and projects, and facilitate the participation of institutions from non-EU countries of the region in projects submitted to and accepted by the European Commission.

Appendix IV. The European Forest Genetic Resources Programme (EUFORGEN)

The genetic diversity of European forests, while it has attracted far less attention than the tropical rainforests, has proven to be particularly vulnerable due to the recent forest decline. Concern about European forests was expressed at the first Ministerial Conference for the Protection of Forests in Europe held in 1990 in Strasbourg. That conference recommended the development of a flexible mechanism coordinating the conservation efforts of individual countries. A follow-up committee of Resolution 2 ('Conservation of Forest Genetic Resources') initiated an international survey on the present status of forest genetic resources in Europe and prepared the basis for collaboration in pilot networks. The International Plant Genetic Resources Institute (IPGRI), together with the Food and Agriculture Organization of the United Nations (FAO), then proposed the establishment of the European Forest Genetic Resources Programme (EUFORGEN). The Programme was endorsed by the second Ministerial Conference (Helsinki in 1993) and became operational in October 1994. EUFORGEN now has 22 member countries with a further eight expected to join soon.

The main activities of the Programme are concentrated into four pilot species networks. The selected set of species reflects national priorities for the conservation of most threatened genetic diversity at a species level and covers different types of ecogeographical (and probably genetic) distribution patterns as well as different reproductive systems. In the networks, forest geneticists and other forestry specialists meet and work together to analyze countries' needs, exchange experiences and develop jointly conservation strategies and methods. Besides that, EUFORGEN aims at providing a contribution to international collaborative initiatives and at facilitating the information flow among countries.

Network members and other scientists and forest managers from participating countries carry out an agreed workplan with their own resources as inputs in kind to the Programme. First meetings of the *Populus nigra* and *Quercus suber* EUFORGEN networks were held in 1994. In early 1995, another *Quercus suber* meeting and the first meeting of the *Picea abies* (Norway spruce) network took place. Another *Populus nigra* network meeting was held in September 1995. The approved workplans of all three networks focus on inventories of genetic resources of the species concerned, development of joint databases and lists of descriptors, identification of common research needs, efforts to submit joint project proposals, development of conservation strategies and guidelines, and promotion of the establishment of national gene reserve forests and complementary measures as part of national conservation programmes. The initial meeting of the 'noble hardwoods' network will be organized in March 1996.

EUFORGEN is overseen by a committee of national coordinators nominated by the participating countries. A meeting of this Steering Committee will be held in November 1995. Among other matters, the member countries will discuss creation of new networks for additional species, representation of countries in the networks, interaction with other regional/global programmes and promotion of public awareness about forest genetic resources in Europe. At the occasion of that meeting, a workshop addressing most important European forest genetic resources issues will be convened offering an input to the Fourth International Technical Conference on Plant Genetic Resources.

Appendix V. The ESCORENA System of Cooperative Research Networks in Agriculture

FAO's European System of Cooperative Research Networks in Agriculture (ESCORENA), is characterized by two basic elements: a truly cooperative and voluntary research approach and an awareness of the need for sustainability of rural/agricultural systems and for a constructive environment-sound agricultural production approach.

The main objectives of ESCORENA are:

- to promote voluntary exchange of information and experimental data on selected subject matters;
- to support joint applied research on selected subject matters of common interest according to an accepted methodology, agreed division of tasks and timetable;
- to facilitate voluntary exchange of resources (e.g. germplasm, technology transfer and persons);
- to establish close links between European researchers and institutions working on the same subject/problem, and stimulation of interaction; and
- to accelerate the transfer of European technological advances to, and cooperation with developing countries.

Cooperation in the ESCORENA research networks is voluntary. Each network develops its own programme and ways of implementation, draws up its own applied research programme, organizes the exchange of information on the latest scientific experiences, prepares methods of work best suited to its specific requirements and divides the tasks among cooperating institutions in accordance with their interests, capabilities and fields of specialization. The cooperating institutions are free to choose the subject matter in which they cooperate and exchange information. The networks have a simple and flexible organizational set-up and their activities are basically self-regulated. Their decisions are generally taken by consensus. Each network carries out activities on a few well-defined subjects and not on a complete inventory of topics drawn from all the respective fields. For each topic in which a sufficient number of countries has expressed interest, a sub-network or working group is established. These working groups have specific tasks and a determined life span and are easier to convene and to terminate upon completion of their tasks.

The networks which concentrate activities on plants are the following:

- Citrus Improvement for the Wider Mediterranean Region (Working Group: Germplasm Collection, Conservation, Evaluation and Exchange)
- Inter-Regional Cooperative Network on Nuts (Working Group on Tree Nut Genetic Resources, Identification, Evaluation and Conservation)
- Olive Genetic Variability Network (Working Group: Conservation and Utilization of Genetic Resources)
- Research Network on Sunflower
- Research Network on Soybean
- Research and Development Network on Pastures and Fodder Crops (Working Group: Mediterranean Forage Resources)
- Research Network on Cotton
- Inter-Region Research Network on Rice
- Research Network on Flax (Working Group: Breeding and Genetic Resources)

- Mediterranean Fruit Inter-Country Network (MESFIN) (Working Group: Sub-network on Plant Genetic Resources Conservation)

The coordination centres, network coordinators and the chairmen of the working groups are chosen by the network participants themselves, generally for a renewable period of four years. The network coordinators are responsible for the implementation of the agreed work programme and collaborate with FAO in convening workshops, technical meetings and network consultations, and in organizing coordination board meetings. The working group chairmen follow-up the implementation of the adopted programmes and organize workshops, as well as prepare reports, proceedings, studies and guidelines. The Coordinating Board, consisting of the network coordinator and the working group chairmen, meets every two years to review the progress achieved, problems encountered and future programme of activities and identifies areas where cooperation can be improved and proposes the phasing out of activities.

An important more recent feature of ESCORENA network cooperation is the creation of specific inter-regional cooperative research networks on commodities of mutual interest to the European and Near East Regions i.e. cotton, nuts, rice, olives and buffalo and the gradual extension of activities to an increasing number of selected national institutions in interested countries outside the European Region.

ESCORENA and its programmes are regularly monitored and guided by the European Commission on Agriculture (ECA), according to FAO priorities; they are approved by the FAO Governing bodies. Furthermore, the European Research Network's Advisory Committee (ERNAC) was established in 1989 to periodically review on-going activities of ESCORENA, to advise on the usefulness and feasibility of programmes and assess the value of topics proposed for new networks as well as the discontinuation of those networks that have accomplished their task. ERNAC is composed of three highly respected academics/professionals and operates as the overall scientific advisory and evaluating authority of ESCORENA. ERNAC last met on 17 October 1994 in Athens (Greece) to review ESCORENA's activities and discuss its future role in the light of the reorientation of FAO's programmes and priorities as approved by the 106th Session of the Council.

A total of 450 national/regional institutions and laboratories (V) and 2497 experts from 86 countries (VI and VII) participated in ESCORENA activities in 1994: 32 FAO Member Nations from the European Region (REU), 12 Member Nations from the Near East Region (RNE), three belonging to both RNE and REU, 31 FAO Member Nations from other regions and eight from non-Member States from Eastern Europe.

To date, eleven of the networks disseminate written information to the members and interested institutions through a well-established communication system: mostly in the form of a newsletter. In 1994, ten technical reports were published in the REU publication series and eleven meeting reports were published directly by the networks and meeting organizers. Two Experts Consultations were held (Animal Waste Management and Sheep and Goat Research) and the reports printed.

Since the early 1990's, a major effort was made to develop a subregional approach to ESCORENA: first in the Mediterranean Subregional context, in close collaboration with FAO\RNE and the CIHEAM (International Centre for Advanced Mediterranean Studies) and more recently in the Central and Eastern European Sub-region (CEE).

The decision to establish ESCORENA in the early 1970's was based on the principle that in a period of rapid technological and scientific developments, it was

difficult or even impossible for any institution or country to undertake in isolation the necessary scientific and technological research on any subject matter. Well-defined cooperation arrangements among interested national institutions have, therefore, a multiplying effect as each cooperating institution relies not only on its own activities but benefits from the results achieved and the experience gained by those involved. Today, in a period during which we are being confronted with an ever increased need for continuous technological innovation while we are witnessing a general decrease in agricultural research capabilities, the principle of purposeful and well-oriented cooperative research is even more valid than in the past. ESCORENA is an FAO supported operation, based on the people's participation principle.

Facing the new challenges as well as the effects of changing farm structures and production and management systems in a sustainable but also environment-friendly way, presupposes the development and application of technically sound and innovative policies. In this context, ESCORENA has played and can play an even more catalytic and goal-orienting role. During the next biennium the Networks can and should play a pivotal role in the implementation of the three important agreements launched by FAO during 1994:

- Agreement on the Cooperation between FAO and Academic and Research Institutions in Member Nations;
- Agreement Concerning the Use of Experts for Technical Cooperation Amongst Developing Countries (TCDC);
- Agreement Concerning the Use of Experts for Technical Cooperation Amongst Countries in Transition (TCCT).

Appendix VI. Suggestions and Conclusions by the European Union and its Member States - Proposals for a Global Plan of Action

Suggestions and Conclusions by the European Union and its Member States¹. Text incorporating amendments agreed by PROBA 21 September 1995

Proposals for a Global Plan of Action

1 *The aim of the Global Plan*

The general aim of the Global Plan should be to help all interested parties, working together, to conserve (*in situ* and *ex situ*), characterize, evaluate, sustainably utilize and, as necessary, to collect, plant genetic resources in the interests of current and future agriculture (including forestry, industrial crops and horticulture).

The Global Plan should aim specifically to implement the revised International Undertaking on Plant Genetic Resources, in harmony with other relevant international agreements, as part of the global system of plant genetic resources of the FAO.

2 *The strategy to achieve the above aim*

2.1 Associated measures

The Global Plan should be accompanied by the following associated measures:

- a multilateral framework agreement to make germplasm and relevant information from each specific collection available to users;
- a multilateral framework for the fair and equitable sharing of benefits between the providers and the users of plant genetic resources for agriculture and forestry, through which, *inter alia* Farmers' Rights can be realized.

2.2 Technical aspects: (1) Existing work

The Global Plan should help to achieve a better consistency of existing programmes in the field of plant genetic resources, at regional and at global level, in order to improve the overall efficiency of such programmes and to avoid duplication of efforts.

To that end, and in order to know what work is already in hand, a bank of information or inventory is required. This inventory should list projects and activities that are underway at global, regional, national and local level. It should show who pays for the action, who does the work, and for what purpose.

The inventory should be compiled, so far as possible, from the existing sources, and duplication of data collection should be avoided.

The inventory should be used, *inter alia*, to encourage the diffusion of existing knowledge and the use of existing conserved material, and to help the review and evaluation of existing projects and activities, and the establishment of priorities.

¹ **Important note:** These Suggestions and Conclusions for the Global Plan of Action are made without any engagement as to its eventual financing. Nothing is to be inferred or implied as to the negotiation of a financial mechanism, or the commitment to funding, by the European Union and its Member States.

2.3 Technical aspects: (2) Future activities

The Global Plan should encompass activities at global, regional, national and local level (legislative, administrative or policy activities, as appropriate) which contribute towards the overall Aim in order to achieve a better integration of existing programmes.

Due regard should be paid to the activity's cost, and potential benefits.

The following should be considered:

- the activity's relevance to the achievement of local, national, regional and global priorities for the conservation and sustainable use of plant genetic resources;
- the activity's direct value for sustainable agriculture (including forestry);
- the activity's potential value for enhancing the development and employment of national and regional expertise, the development of human resources, and genetic resource science and technology.

2.4 Technical aspects: (3) Management

The Global Plan should include measures to review progress, and to assess results, at fixed intervals. This will assist the permanent updating of priorities at regional and global level.

3 Policy and actions

Priorities should be based on the information that has been collected on the programmes, projects and activities, at local, national, regional and global levels.

The situation of, and the trends in, conservation, characterization, evaluation, utilization and collection of plant genetic resources in agriculture including forestry should continue to be monitored.

Rather than creating new management structures, measures should be taken to better coordinate ongoing efforts. Emphasis should be put on facilitating access to information, to training and to transfer of relevant technology, making maximum use of modern information and other technologies.

Encouragement should be given to the active involvement and cooperation of public and of private organizations, and to the free exchange and dissemination of germplasm and associated information between all interested parties.

Generally, there should be an emphasis on the conservation, characterization, evaluation and sustainable utilization of existing plant genetic resources in agriculture including forestry, rather than on the collection of new ones.

Scientific research and technological development that contributes towards the achievement of the aims of the Global Plan should be encouraged; so as to improve the conservation, and to improve and accelerate the characterization, evaluation and utilization, of plant genetic resources in agriculture including forestry.

Finally, it is important that participants in activities under the Global Plan should aim to ensure the practical utilization of their efforts, to the benefit of sustainable agriculture and to the security of food supplies.

Appendix VII. A Preliminary List of European Union Legislation in the Area of Plant Genetic Resources

An annotated list of European Union legislation, following the structure of the document "Introductory Guidelines for Countries Reports" (International conference and programme for plant genetic resources; Food and Agriculture Organization of the United Nations, Rome).

Introduction: Europe and its agriculture

The Treaty establishing the European Economic Community lays down (Article 38) that the common market shall extend to agriculture and trade in agricultural products. It establishes a common agricultural policy (Article 43), whose objectives shall be (Article 39):

- a) to increase agricultural productivity by promoting technical progress (...)
- b) thus to ensure a fair standard of living for the agricultural community (...)
- c) to stabilize markets
- d) to assure the availability of supplies
- e) to ensure that supplies reach consumers at reasonable prices.

Subsequent evolution of the C.A.P. was governed by a number of legal instruments. These include the Structural Funds, which have the task, amongst others, "to preserve the countryside (inter alia by securing the conservation of natural agricultural resources)".

In June 1992 the Council of Ministers adopted a package of reforms of the common agricultural policy. There are five main objectives:

- 1. to maintain the Community's position as a major agricultural producer and exporter by making its farmers more competitive on home and export markets;
- 2. to bring production down to levels more in line with market demand;
- 3. to focus support for farmers' incomes where it is most needed;
- 4. to encourage farmers to remain on the land;
- 5. to protect the environment and develop the natural potential of the countryside.

Indigenous plant genetic resources: forest genetic resources

In a document prepared by the services of the European Commission on the basis of the opinion of the Standing Forestry Committee (preparation of a European Union position on forestry issues at the agenda of the third meeting of the UN commission on sustainable development (CSD)) the European Union states that the Union is fully committed to sustainable forest management.

The European Union and its Member States are signatory parties to the Resolutions of the Ministerial Conferences on the Protection of Forests in Europe. The sustainable management of natural forests is the subject of Resolution 2 of the Ministerial Conference. The signatory states committed themselves to implement in their own countries, using whatever methods seem most appropriate, a policy for the conservation of forest genetic resources.

Other wild species and wild relatives of crop plants

The Community is party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Some of the species covered by Commission Regulation (EC) No 558/95 of 10 March 1995 are native to the Community.

Landraces (farmers' varieties) and old cultivars

Council Regulation (EEC) No 2081/92 protects geographical indications and designations of origin for agricultural products and foodstuffs.

Council Regulation (EEC) No 2082/92 establishes a scheme of certificates of specific character for agricultural products and foodstuffs. Food products that are made from landraces and old cultivars have opportunity of special protection, so far as the production has either a limited geographical origin, or so far as the production is based on particular traditional raw materials.

Moreover, a Commission proposal is currently under consideration by the Council and by the European Parliament which aims at completing the legislation on the marketing of plant propagating material by a legal basis for the mandate to establish specific conditions to take account of developments in the area of the conservation of genetic resources, such as "on farm conservation and sustainable utilization of plant genetic resources through growing and marketing of landraces and varieties which are naturally adapted to the local and regional conditions and threatened by genetic erosion". This proposal also includes provisions for environmental risk assessment and for food safety assessment in the case of transgenic varieties of plants, to be accomplished at the time of official acceptance of those varieties.

Regulation (EC) No 1467/94 provides for the support of actions on the conservation, characterization, collection and utilization of genetic resources in agriculture. In such actions, the recording of traditional regional experience and knowledge of farmers and horticulturalists on methods of cultivation, specific uses, processing, taste, etc. is an eligible activity.

Conservation activities

Regulation (EC) N, 1467/94 introduces a first five-year programme aimed at the effective development and coordination of the conservation, characterization, collection and utilization of genetic resources in agriculture. All the topics covered in Chapter 3 are eligible for support under this programme.

***In situ* conservation activities**

In situ conservation activities are supported by Council Regulation (EEC) No 2078/92 "on agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside". This Regulation provides, "aid for farmers who undertake: ... to use other farming practices compatible with the requirements of protection of the environment and natural resources, as well as maintenance of the countryside and the landscape, or to rear animals of local breeds in danger of extinction; ... to ensure the upkeep of abandoned farmlands or woodlands; ... to set aside farmland for at least 20 years with a view to its use for purposes connected with the environment, in particular for the establishment of biotope reserves or natural parks or for the protection of hydrological systems...".

Also, Council Regulation (EEC) No 2328/91 on improving the efficiency of agricultural structures "establishes measures which aim to contribute to the safeguarding of the environment and the preservation of the countryside, including the long-term conservation of natural farming resources...measures to protect the environment and safeguard the countryside by encouraging appropriate farming methods".

Ex situ conservation activities

Use of *ex situ* collections by researchers is encouraged by Council Decision of 23 November 1994 "adopting a specific programme of research, technological development and demonstration in the field of agriculture and fisheries (including agroindustry, food technologies, forestry, aquaculture and rural development (1994 to 1998)". The Decision notes that "A la suite de la conférence des Nations unies sur l'environnement et le développement qui a eu lieu à Rio de Janeiro en 1992, la Communauté est déterminée à oeuvrer pour la conservation, la caractérisation et l'utilisation de ressources génétiques en agriculture et pour la protection et la gestion durable des forêts. Lors des conférences ministérielles sur la protection des forêts en Europe (Strasbourg, 1990 et Helsinki, 1993) elle s'est engagée à contribuer activement à une série d'activités coordonnées au niveau européen, qui devraient permettre une meilleure protection et une gestion écologiquement viable des ressources forestières. Pour que ces objectifs puissent être atteints, des travaux de recherche sont nécessaires."

Storage facilities

As already mentioned, Regulation (EC) No 1467/94 provides for actions on the conservation, characterization, collection and utilization of genetic resources in agriculture.

Documentation

As already mentioned, Regulation (EC) No 1467/94 provides for actions on the conservation, characterization, collection and utilization of genetic resources in agriculture.

Evaluation and characterization

As already mentioned, Regulation (EC) No 1467/94 provides for actions on the conservation, characterization, collection and utilization of genetic resources in agriculture.

Regeneration

The European Union's specific programme of research, technological development and demonstration in the field of agriculture and fisheries (including agroindustry, food technologies, forestry, aquaculture and rural development 1994-1998) includes among its research tasks "Preservation and encouragement of the genetic heritage and biodiversity in crops".

Forest genetic resources

The essential role of forests in "maintaining basic equilibria, particularly as regards the soil, water resources, climate, fauna and flora" is recognised by Council Regulation (EEC) No 2158/92 of 23 July 1992, which provides measures to help protect areas of high fire risk.

Use of PGR collections

As regards access by farmers to genetic resources, the EU presented Declarations for the Union and its Member States on Conditions of Access to Plant Genetic Resources for Agriculture, and on Farmers' Rights, both at the Extraordinary Session of the FAO Commission on Plant Genetic Resources (Rome, 7-11 November 1994), and at the Sixth Session of the same FAO Commission (Rome, 19-30 June 1995) (the text of the latter declaration is given in Annex to this paper).

Improving PGR utilization

As already mentioned, Regulation (EC) No 1467/94 provides for actions on the conservation, characterization, collection and utilization of genetic resources in agriculture. The programme puts emphasis on directing work at Community level, in particular, towards improving the quality of agricultural products and finding new uses for traditional or new agricultural products with a view to increasing their added value. The programmes' accompanying measures include the promotion of the utilization of results.

Goals, policies, programmes and legislation

Council Regulation (EC) No 1467/94 of 20 June 1994 "on the conservation, characterization, collection and utilization of genetic resources in agriculture" introduces a first five year programme which will help coordination of individual actions by the Member States.

Training

As already mentioned, Regulation (EC) No 1467/94 provides for actions on the conservation, characterization, collection and utilization of genetic resources in agriculture.

The programme's "Accompanying measures" provide for the support of training and mobility schemes for specialist personnel.

Other related legislation

In addition to the rules concerning the conservation and sustainable utilization of plant genetic resources for food agriculture, the European Union has developed a comprehensive set of legislation relating to:

- the protection of plants including plant genetic resources, to prevent the introduction into the Community or the spread within the Community of organisms harmful to plants or plant products (phytosanitary legislation). For Community products, the concept of plant health inspection at the place of production has been implemented and the "plant passport" system has been introduced. The Commission has in 1992 set up a Community Plant Health Inspectorate to monitor and assist national inspectorates.
 - * Council Directive 77/93/EEC of 21 December 1976 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community (OJ No L 26, 31.01.1977, p. 20), as last amended by Commission Directive 95/41/EC (OJ No L 182, 02.08.1995, p. 27)
- the quality of plant propagating material of agricultural and horticultural crops and of forests (**legislation on the marketing of plant propagating material**). The seed marketing Directives prescribe minimum quality standards for seeds, to ensure that purchasers are insured of receiving seeds of a reasonable and uniform quality, and require checks to be made on seed health, on varietal and analytical purity and germination; they also prescribe conditions and procedures for the official certification of propagating material including official field inspections of crops and testing of seeds.

Seeds of agricultural plant species may only be marketed if they have been officially certified in accordance with the requirements of the appropriate Directives, and if the variety in question is listed on the EU Common Catalogue. To achieve the listing status, the variety must undergo official tests for

Distinctness, Uniformity and Stability (DUS) and - in the case of agricultural plant species - official trials for Value for Cultivation and Use (VCU).

- * Council Directive 66/400/EEC of 14 June 1966 on the marketing of beet seed, as last amended by Directive 90/654/EEC (OJ No 353, 17.12.1990, p. 48)
- * Council Directive 66/401/EEC of 14 June 1966 on the marketing of fodder plant seed, as last amended by Commission Directive 92/19/EEC (OJ No L 104, 22.04.1992, p. 61)
- * Council Directive 66/402/EEC of 14 June 1966 on the marketing of cereal seed, as last amended by Commission Directive 93/2/EEC (OJ No L 54, 05.03.1993, p. 20)
- * Council Directive 66/403/EEC of 14 June 1966 on the marketing of seed potatoes, as last amended by Council Directive 93/3/EEC (OJ No L 54, 05.03.1993, p. 21)
- * Council Directive 66/404/EEC of 14 June 1966 on the marketing of forest reproductive material (OJ No 125, 11.07.1966, p. 2326/66) as last amended by Council Directive 90/654/EEC (OJ No L 353, 17.12.1990, p. 48)
- * Council Directive 68/193/EEC of 9 April 1968 on the marketing of material for the vegetative propagation of the vine (OJ No L 93, 17.04.1968, p. 15) as last amended by Council Directive 90/654/EEC (OJ No L 353, 17.12.1990, p. 48)
- * Council Directive 69/208/EEC of 30 June 1969 on the marketing of seed of oil and fibre plants, as last amended by Commission Directive 92/107/EEC (OJ No L 16, 25.01.1993, p. 1)
- * Council Directive 70/457/EEC of 29 September 1970 on the Common Catalogue of varieties of agricultural plant species, as last amended by Council Directive 90/654/EEC (OJ No L 353, 17.12.1990, p. 48)
- * Council Directive 70/458/EEC of 29 September 1970 on the marketing of vegetable seed, as last amended by Council Directive 90/654/EEC (OJ No L 353, 17.12.1990, p. 48)
- * Council Directive 91/682/EEC of 19 December 1991 on the marketing of ornamental plant propagating material and ornamental plants (OJ No L 376, 31.12.1991, p. 21)
- * Council Directive 92/33/EEC of 28 April 1992 on the marketing of vegetable propagating and planting material, other than seed (OJ No L 157, 16.06.1992, p. 1)
- * Council Directive 92/34/EEC of 28 April 1992 on the marketing of fruit plant propagating material and fruit plants intended for fruit production (OJ No L 157, 10.06.1992, p. 10)

Intellectual property rights

Community plant variety rights

Legislation:

- * Council Regulation (EC) No 2100/94 of 27 July 1994 on Community plant variety rights (OJ No L 227, 01.09.1994, p.1)
- * Commission Regulation (EC) No 1238/95 of 31 May 1995 establishing implementing rules for the application of Council Regulation (EC) No 2100/94 as regards the fees payable to the Community Plant Variety Office (OJ No L 121, 01.06.1995, p.31)

- * Commission Regulation (EC) No 1239/95 of 31 May 1995 establishing implementing rules for the application of Council Regulation (EC) No 2100/94 as regards proceedings before the Community Plant Variety Office (OJ No L 121, 01.06.1995, p.37)
- * Commission Regulation (EC) No 1768/95 of 24 July 1995 on implementing rules on the agricultural exemption provided for in Article 14 (3) of Council Regulation (EC) No 2100/94 on Community plant variety rights (OJ No L 173, 25.07.1995, p.14)

The Community has established a system of Community plant variety rights as sole and exclusive form of Community industrial property right for plant varieties as a measure for the completion of the Internal Market. This Community system will co-exist with those which already exist on the territory of Member States and provides for the grant of a uniform protection with effect throughout the entire European Union, upon a single application by an interested plant breeder and through a single decision of the Community Plant Variety Office. This Office created by Regulation No 2100/94 is an independent body of the Community and is operational since April 1995 under a provisional address in Brussels.

The Community system is shaped in accordance with the UPOV-Convention of 1991. In consequence, a Community plant variety right can only be granted to a plant variety being distinct, uniform, stable and new, and to a plant breeder (or his successor in title) who has bred or discovered and developed such variety. If such protection is granted, only its holder is entitled to effect acts relating to propagation, production, conditioning, marketing etc of propagating material and, where appropriate, harvested material of the protected variety or to authorize third persons to effect such acts.

Since such protection covers also acts relating to propagation, the use of farm-saved seed by farmers for propagating purposes ("farmer's exemption") would fall under its scope. In this respect, the Community made use of the option provided for under Article 15 (2) of the UPOV-act 1991 and authorized - in form of a derogation from the general effects of a Community plant variety right farmers to save - in respect of certain agricultural crops - the product of their harvest for sowing within their holding. Such authorization is in particular accompanied by the requirement to pay an equitable remuneration to the holder which shall be sensibly lower than the relevant amount charged for the licensed production of propagating material of the same variety; small farmers are exempted from that obligation.

Other matters linked to research

Council Decision of 21 November 1994 "concerning the rules for the dissemination of the research results from the specific programmes of research, technological development and demonstration of the European Community" lays down particular rules for researchers working in Community-supported projects.

Other policies

As regards policy on exchange of plant genetic resources, and the export of plant genetic resources, the EC made a detailed statement (3 pages) on Conditions of Access to Plant Genetic Resources for Agriculture, and on Farmers' Rights, at the Extraordinary Session of the FAO Commission on Plant Genetic Resources (Rome, 7-11 November 1994).

International collaboration

The call for proposals for the specific programme for research and technological development and demonstration in the field of cooperation with third countries and international organizations (Official Journal N, C 64/8 of 15.3.95), provides for scientific and technological cooperation with developing countries. In particular research actions are called for on "... relationships between urban settlements, equitable economic growth and sustainable management of natural resources ... interactions between soils, water and biotic resources in agriculturally converted or more natural ecosystems ... enhance productivity including maintenance of adequate levels of biodiversity and maintenance of diversity in production systems and cultures ...".

Research on "tools to characterise biodiversity" is eligible for support under the specific programme of research and technological development, including demonstration, in the field of biotechnology (1994-1998) ((OJ L 361 of 31.12.94)).

UNCED

The Union is a signatory to Agenda 21.

Convention on Biological Diversity

The Community is a party to the Convention on Biological Diversity (Council Decision 93/626/EEC of 25 October 1993 concerning the Conclusion of the Convention on Biological diversity; OJ 13 December 1993, 36 L309 page 1)

FAO global system

The Union is a member of the FAO, and a signatory to the Undertaking.

International agricultural research centres: the CGIAR

The Community (DG I, budget line Latin America and Asia) subscribes annually to the CGIAR for the core budget of specific institutes.

On 29 September 1994 the Council (of European Research Ministers) announced that it was taking an European initiative for international agricultural research, to improve coherence and cost effectiveness. The Commission is charged to elaborate and report on the matter at the Council of Ministers of Research in June 1995. A document "Europe and Agricultural Research for Development", comprising a Political Statement and an 8 page Memorandum, was presented by the CGIAR European Donors at the CGIAR Ministerial level meeting (Lucerne, Switzerland, February 9-10, 1995). A process of reflection has started and the Commission will report to the Council of Ministers of Research in June 1995.

The Commission has collaborated, and is collaborating with the International Plant Genetic Resources Institute (IPGRI), Rome, on databases of European collections of plant genetic resources, and on crop plant descriptors.

Regional intergovernmental initiatives

The Union collaborates closely with ECP/GR.

Bilateral intergovernmental initiatives

The European Environment Agency coordinates the "European environment information and observation network". This provides the Community and the Member States with objective, reliable and comparable information to enable them to take the measures necessary to protect the environment, as well as to be able to assess the results of these measures. It will also ensure that the public is properly

informed about the state of the environments. The network includes information on, notably, the state of the soil, fauna, flora and biotopes; land uses and natural resources.

Annex

**Declaration
of
The European Community and its Member States for the Sixth Session of the
FAO Commission on Plant Genetic Resources
(Rome, 19-30 June 1995)**

The European Community and its Member States consider that the Scope of the Undertaking on Plant Genetic Resources should relate to plant genetic resources for food and agriculture (PGRFA) as a basis for meeting present and future needs for the growing world population.

The European Community and its Member States recognize that plant genetic resources constitute a global public good on which all countries, both developed and developing are largely interdependent; plant genetic resources have a crucial input to both farming and plant breeding operations, therefore their conservation, characterization, evaluation and sustainable utilization are of utmost importance as an insurance against genetic erosion and in view of future needs at local, national regional and global levels.

A multilateral agreement is vital to guarantee access to the required diversity and to the specific characteristics of plant genetic resources, and for a fair and equitable sharing of benefits derived from them.

Because of the mutual benefits of an unrestricted access to PGRFA and the expected difficulties for making a distinction between those acquired prior the entry into force of the Convention on Biodiversity (CBD) and those acquired thereafter, the multilateral agreement should, in principle comprise all kinds of PGRFA designated to it, irrespective of the date of acquisition by the contracting party.

The European Community and its Member States agree to the "Farmers' Rights" as a socio-economic concept which recognizes the contribution of farmers to conservation and sustainable utilization of plant genetic resources as a major investment in food security. The implementation of "Farmers' Rights" should form an essential element in an integrated strategy for conservation and sustainable utilization of plant genetic resources, promotion of training and transfer of technology in the context of sustainable agriculture.

Priorities and programmes necessary to give effect to that integrated strategy have to be developed at local, national, regional and global level. The existing regional and international networks provide a mechanism for implementing programmes which strengthen technical management capacity, and for implementing country programmes which would ensure a fair and equitable sharing of the benefits derived from plant genetic resources and "Farmers' Rights". Eligibility for participation in these programmes might include the following criteria:

- a) the participation in the multilateral agreement system to make germplasm available;
- b) the existence of a viable national programme for the conservation and sustainable utilization of plant genetic resources for food and agriculture;
- c) the support of *in-situ* conservation in areas of crop diversity as a strategy to address both evolution and equity;
- d) the risk of genetic erosion, and

- e) the strategic value of the crop(s) for the country/region as a major investment in food security.

As far as the "Global Plan of Action" is concerned, the European Community and its Member States express their thanks to the FAO secretariat for the "Outline of the Global Plan of Action for the conservation and sustainable utilization of plant genetic resources for food and agriculture" (document CPGR-6/95/11).

As to the modalities for the preparation of the Global Plan of Action, the Community and its Member States note that the Global Plan of Action is to be based on Country Reports, and on the discussion at regional meetings. The European Community therefore looks forward to the European Regional Meeting at Nitra in September 1995 for an appropriate exchange of views.

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Part III.

Recommendations of the European Forest Genetic Resources Workshop

21 November 1995, Sopron, Hungary



European Forest Genetic Resources Workshop ¹

Introduction

The European Forest Genetic Resources Workshop was organized within the framework of the European Forest Genetic Resources Programme (EUFORGEN) as an input of European countries to the preparatory process of the Fourth International Technical Conference on Plant Genetic Resources. It was held on 21 November 1995 in Sopron, Hungary.

Delegates from 27 European countries attended the Workshop (Austria, Belarus, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Malta, Moldova, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Turkey and Ukraine).

The Workshop was divided into four plenary sessions:

1. Introductory session
2. Development of strategies for conservation and use of forest genetic resources
3. Conservation strategies applied in European countries and subregions
4. European forestry input to the Global Plan of Action

IPGRI will publish a report of the Workshop with all presentations in 1996.

The Workshop was chaired by Prof. Tore Skrøppa from Norway and Ms Christel Palmberg-Lerche from FAO acted as Vice-Chair. Several recommendations were developed on issues which were felt to be relevant to the Conference in general and to the Global Plan of Action in particular.

The outcomes of the Regional Meeting on Plant Genetic Resources held in Nitra, Slovakia, in September 1995 as well as the two other preparatory workshops on forest genetic resources (Berkeley, California, in June 1995 and Toronto, Canada, in June 1995) were taken into consideration, and complementary recommendations were developed.

Forest genetic resources in Europe

The Workshop delegates recognized that strategies and methodologies applicable to the conservation and sustainable use of forest genetic resources differed decisively from those applicable to genetic resources of agricultural crops. Forest trees are, to a great extent, part of undomesticated populations in complex forest ecosystems and typically carry substantial levels of genetic variation. Forest ecosystems provide products and environmental services which include timber and other goods and commodities, protection of soil and water, recreation, and genetic materials of both woody and non-woody species. The management of forest genetic resources must thus consider the maintenance and enhancement of a whole range of resource values and product values of the forest ecosystem, and strategies aimed at the conservation of forest genetic resources are therefore generally much broader in scope than those of agricultural crops. The need to ensure adaptability of long-lived tree populations to environmental change both in time and in space is an important consideration in the management of these resources, and underlines the essential requirement to maintain a broad genetic base.

The geographical region of Europe includes ecologically diverse, temperate, boreal and Mediterranean type ecosystems. Many tree species found in Europe,

¹ organized by IPGRI in collaboration with FAO Forestry Department

however, have a wide distribution range across the continent and are shared among many countries, in spite of environmental differences among them. Furthermore, European forests share similar traditions in silviculture and management systems, which provide a common basis for incorporating present concerns over genetic resources into the forestry practice.

Forests in Europe have not experienced drastic loss of tree species. However, forest tree populations have been subject to human impact and intensive utilization for centuries. This has had both positive and negative effects on their genetic resources. The introduction of species and provenances from other countries and regions for the establishment of forest plantations has also influenced the genetic resources of European forest tree populations.

A recent concern in the region has been forest decline attributed to environmental changes and, above all, to industrial atmospheric pollution.

Recent privatization of forests in numerous countries with economies in transition gives rise to particular concerns and new challenges in their management and in the conservation and sustained use of the genetic resources they contain.

Recommendations

A. Fourth International Technical Conference on Plant Genetic Resources

Recognizing the importance of the Fourth International Technical Conference and its impact on the forestry in Europe, noting that in most countries, the overall management and the institutional structure responsible for forest genetic resources fall under a different administrative competence than the crops domain, and emphasizing that involvement of both crop and forest genetic resources experts in the Conference would be of mutual benefit in elaborating overall strategies, the Workshop **recommended** that

- national delegations to the Conference include expertise on forest genetic resources;
- specific mention of forest genetic resources be included in invitation letters and background materials submitted to countries in Europe, and that correspondence related to the Fourth International Technical Conference be copied to Heads of Forest Services;
- a circular letter drawing the attention to this need, be prepared and distributed through the coordinating secretariat of EUFORGEN, in consultation with FAO.

B. Global Plan of Action

It was **recognized** that national strategies for the conservation of forest genetic resources should be elaborated in accordance with perceived national needs, institutional possibilities and financial and resource related realities. These strategies should be established within a regional framework to ensure complementarity and overall coverage.

Strongly supporting the recommendations given by the preparatory workshops on forest genetic resources in, respectively, Berkeley, USA and Toronto, Canada, and in line with their recommendations, the European Forest Genetic Resources Workshop **recommended** that

- each country establish and develop a national strategy for the conservation of forest genetic resources;
- national strategies include a core set of common, key elements (such as lists of target species, methods to be applied and organizations involved).

The Workshop noted that a number of European countries had already developed formal national programmes on forest genetic resources. Through regional collaborative activities, countries which have not yet developed a national programme could benefit from operational programmes in other countries.

The Workshop **recognized** that EUFORGEN is a framework which can facilitate collaboration in the field of forest genetic resources in Europe. **Supporting** the recommendation of the Regional Meeting on Plant Genetic Resources (Nitra, Slovakia, in September 1995) and considering the outcomes of the Steering Committee of EUFORGEN (Sopron, Hungary, in November 1995), the Workshop **recommended** that:

- EUFORGEN be considered as the platform for the implementation of the forest genetic resources components of the Global Plan of Action in Europe and that this task be carried out in close collaboration with FAO, IUFRO and other relevant organizations.

Recognizing the basic link between conservation, tree improvement and managed use of forest genetic resources, the Workshop **recommended** that:

- a balance be sought between *in situ* conservation of forest genetic resources and sustainable forest management on the one hand, and management of protected areas on the other;
- *in situ* conservation and management of genetic resources, and tree improvement activities (*ex situ*) be considered as complementary strategies.

Recognizing that there has been a long tradition of forest management and silvicultural practices in European countries, the Workshop **recommended** that

- the activities on forest genetic resources and their conservation be increasingly integrated into applied silviculture and forest management systems.

Recognizing that protected areas potentially contribute towards the conservation of genetic resources within the framework of an overall conservation strategy for given target species, the Workshop **recommended** that

- rules and legislation governing the collection of reproductive material (for conservation and research purposes) from strictly protected areas be carefully reviewed, in collaboration with competent authorities, to maximize benefits for all concerned.

Recognizing that lack of knowledge is a major constraint to effective genetic conservation, and fully supporting the recommendations made in this sense by the preparatory workshops on forest genetic resources in North America as well as by the Regional Meeting on Plant Genetic Resources, the Workshop **recommended** that

- steps be taken to coordinate research and harmonize research methods on a regional level;
- monitoring of genetic diversity of forest reproductive material be given high priority in research;
- research be conducted to improve silvicultural and forest management methods, in order to secure long term maintenance and enhancement of genetic diversity;
- education be promoted and training opportunities be increased in the field of forest genetic resources;
- public awareness about forest genetic resources be promoted at all levels.