

The ECP/GR, an example of cooperation for crop genetic resources in Europe

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Introduction

Promoting the development of the East African Plant Genetic Resources Network (EAPGREN) was the main objective of the international workshop held in Zschortau, Germany, in Oct 2002. This was an appropriate occasion to present the example of a European network, 22 years after its formal establishment. This paper contains a historical review of the European Co-operative Programme for Crop Genetic Resources Networks (ECP/GR), the description of its current organizational structure and a summary of the main outputs delivered by the programme. The author's analysis of the programme's strengths, weaknesses and future perspectives are also presented. Although ECP/GR developed in a different context, the overall experience of ECP/GR can inspire the foundation of EAPGREN and offer a useful comparison, considering that the two networks share the general objective of improving plant genetic resources conservation and use in the respective regions.

Historical review

Preparatory phase

The original concept of ECP/GR was identified in the mid-seventies by the European office of the United Nations Development Programme (UNDP), as an area of cooperation to be established between East and West Europe. The preparation phase (1975–1979) of this project was based on background evidence that, on the one hand, the rapid disappearance of older varieties of crop species could have limited the ability of plant breeders to respond to the needs of a changing world and, on the other end, the potential of plant material held in collections was not being fully exploited. It was considered that different programmes could have contributed to truly international genetic resources conservation efforts only if coordinated in a worldwide collaborative network. Considering that more than two thirds of the world's plant germplasm collection was maintained in Europe, the European Association for Research on Plant breeders (EUCARPIA) was making efforts to develop inter-institutional links between genebanks in Europe. The role of ECP/GR was to strengthen inter-governmental and sub-regional links and coordinate activities, thus becoming the European component of a global network. At that time, four sub-regional initiatives for plant genetic resources were active in Europe. They include:

- The European Commission Programme on Better Use of Gene Banks and Resistance Breeding (nine countries)
- The Genetic Resources Network of the Council for Mutual Economic Assistance (CMEA) (seven countries in the eastern Europe)
- The Nordic Gene Bank (five Nordic countries)
- The Mediterranean Germplasm Programme of the International Board for Plant Genetic Resources (IBPGR), involving 13 countries of which 8 were from Europe.

The Food and Agriculture Organization (FAO) was the executing agency of the ECP/GR project and Ms Erna Bennet acted as the first coordinator of the programme during the preparatory phase. An intense series of consultative missions and discussions took place between 1975 and 1979, involving FAO, IBPGR, the EUCARPIA Genebank Committee and the United Nations Development Programme (UNDP) European office (FAO 1979). The representatives from 22 countries (FAO 1980) eventually unanimously endorsed a project document, finalized by a UNDP/FAO Coordination Mission in 1979. A development objective was set as *“to contribute to development of agriculture in the member countries by the more effective use of plant genetic resources,*

which are well conserved and accessible, and to further the activities of national and sub-regional institutions for plant genetic resources in Europe, by strengthening cooperation between such institutions". Immediate objectives were:

- To create the means for full and free exchange of available plant genetic resources and related data, to make this material available to all European plant breeders
- To coordinate the collection and conservation of European plant genetic resources not yet existing in collection
- To make the plant genetic material and related data available to the plant breeders in developing countries and facilitate participation of Europe in the global network of plant genetic resources
- To coordinate the evaluation of plant genetic resources to be carried out by national and sub-regional centres in Europe and reduce the duplication of efforts on rejuvenating them.

A strategy was defined whereby each country would contribute in kind to the project, by including its national plant genetic resources conservation activities for plant breeding into the coordinated regional programme.

Phase I (1980 – 1982)

The ECP/GR started working on 1 Oct 1980, after the first eight countries signed the project document. The United Nations Development Fund (UNDP) funded the initial two years phase while FAO was the executing agency. The Executive Secretary (Mr G. De Bakker) was based at the UNDP headquarters in Geneva, Switzerland. A governing body comprised of members (21 member country representatives; UNDP; FAO; Executive Secretary, Chairman of Scientific Advisory Committee) and observers (sub-regional European organizations; IBPGR; other European countries; ECP/GR Scientific Advisory Committee, International Convention for the Protection of New Varieties of Plants (UPOV); and consultants to the Executive Secretary). Achievement during Phase I include organizing meetings of eight crop working groups, appointing national coordinators, fundraising and organizing genetic resources activities by several countries and training scientists from various countries.

Phase II (1983 – 1986)

At the request of the member countries, beginning 1 Jan 1983, the project started working under the aegis of IBPGR, with FAO as the executing agency. An Executive Secretary (Mr P. Perret), based in Rome was appointed. As initially planned, during Phase II the member countries matched the UNDP funding by contributing 50% of the programme's budget.

A project evaluation mission, commissioned by UNDP/FAO during Phase I, recommended that ECP/GR should not include capabilities that it did not have, such as "creating the means for full and free exchange of available plant material..." Consequently, a modified set of objectives that would remain unaltered for the following 10 years were defined (box 1)

Box 1. ECP/GR objectives (Phase II)

- Create a system to facilitate:
 - direct contact between workers engaged in genetic resources activities
 - unhindered exchange of plant genetic resources
 - establishment of information systems and data exchange between genebanks
- provide plant scientists with:
 - up-to-date information on collections of seeds and living plants held by public institutions and private breeders in Europe
- Establish for specific crops joint activities including:
 - expeditions to collect genetic variants not held in existing collections
 - characterization and evaluation of germplasm.
- Establish a self-sustaining co-operative network of genetic resources activities between the participating countries that will be effective for Phase III and in the future without soliciting help from UNDP.

The Governing Board was replaced by a more active technical consultative committee, composed of scientists that would advise IBPGR in their individual capacity on decisions about the programme. The programme work was based on crop working groups, limited initially to six selected crops (*Allium*, *Avena*, barley, forages, *Prunus* and sunflower). The first European crop databases were established and increased exchange of information led to the production of preliminary inventories.

Phase III (1987 – 1989) and IV (1990 – 1993)

In Phase III, the programme became self-sustaining. In Phase IV the coordinator's time was reduced to one-quarter and the programme's name changed to European Co-operative Programme for Crop Genetic Resources Networks, emphasizing the networking aspect. The most impressive development during these phases was the implementation of crop databases for some 24 species and group of species or genera located in 13 countries. The collaborative initiative promoted by the working groups also allowed significant developments in the following areas:

- Gaps in the collections were identified
- Coordinated collecting missions were undertaken
- Descriptors' lists were developed
- Standard reference varieties were selected
- Core collections were defined
- National programmes development was facilitated
- Training needs of genebank personnel were supported
- The flow of information and germplasm was improved.

Phase V (1994– 1998)

The reduced secretarial support of the previous phase led to a less proactive approach and the position of a full time coordinator was reintroduced in Phase V, along with several modifications to the general structure of the programme. The phase duration was increased from 3 to 5 years. Objectives were reviewed and more general targets, such as ensuring long-term conservation and encouraging the increased use of plant genetic resources in Europe were addressed. Collaboration between national programmes remained a primary focus of the programme, aiming to increase joint activities and developing joint project proposals also in view of a new European Commission programme for conservation and use of genetic resources in agriculture. The strengthening of links between east and west European programmes characterized this period, after the fall of the Berlin wall and the threat to genetic resources programmes in eastern Europe (box 2).

Box 2. ECP/GR objectives (Phase V)

- To ensure the long-term conservation and to facilitate and encourage the increased use 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.

The concept of networks (crop and thematic) was introduced as broad organisational structures that accommodate activities contributing to general objectives of the programme. The operational units, however, remained the working groups. The programme was meant to provide funding for working group meetings and the publication of meetings' reports, while

the working groups (eight at the end of Phase V) would agree on work plans of actions to be carried out by participating institutions as inputs, in kind, to the programme.

The new structure (figure 1) was planned to allow more flexibility and to extend the scope beyond a limited number of crops or themes. The Technical Consultative Committee was renamed the Steering Committee, composed of national coordinators, with observers from the International Association of Plant Breeders (ASSINSEL, now ISF-International Seed Federation), the Euro-MAB Programme (Man and Biosphere), FAO, IPGRI, the Nordic Genebank and a representative from the European NGOs. The European Commission was also invited to become a full member of the programme, but a formal arrangement was not established. Detailed functions of the Steering Committee, country coordinators, working group members and coordinating secretariat were defined (box 3). After IBPGR became independent from FAO with the new name of the International Plant Genetic Resources Institute (IPGRI), the institute continued to provide the Coordinating Secretariat of ECP/GR, as requested by the Steering Committee.

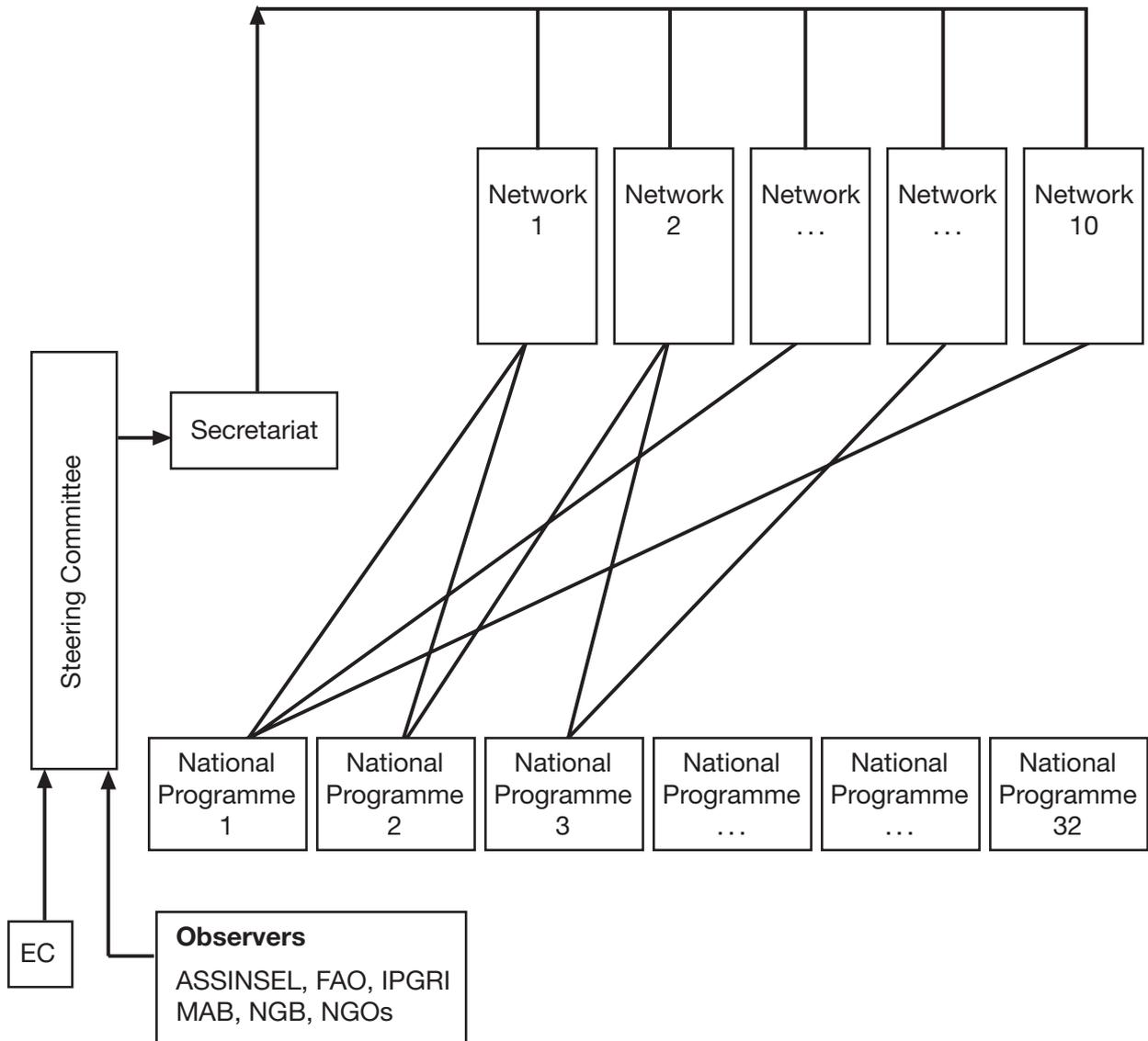


Figure 1. Operational structure of ECP/GR during phase V

Box 3. Functions of the coordinating secretariat, working group members and national coordinators**Steering committee**

This committee was composed of member country coordinators with the role to:

- maintain the overall responsibility for the programme
- approve its budget
- provide technical and political guidance
- decide the general scope of the networks, the establishment and termination of the working groups
- provide guidelines
- approve *ad hoc* activities
- mandate the coordinating secretariat to carry out decisions.

Coordinating secretariat

The secretariat provided by IPGRI plays the following role:

- ensures implementation of the programme, as mandated by the Steering Committee
- coordinates activities carried out in the framework of the programme
- is responsible for the financial management
- provides technical and financial reports to the Steering Committee
- initiates *ad hoc* activities
- gathers and distributes information
- assists in the formulation of project proposals for joint activities
- searches for donors to support particular elements of work plans
- links with other regions
- contributes to public awareness

Working group members

- Attending and corresponding members have a representative role for the particular crop and are charged with 'taking home' the recommendations and the work plan agreed upon during the meeting

Country coordinators

- represent the ECP/GR to sponsoring ministries and act as a liaison point between IPGRI, ministries and participating institutes
- maintain close contact with working group chairmen or members to monitor progress and identify potential problems with databases and collections
- obtain the necessary governmental commitment to the programme and ensure that the required support is provided to institutes to allow them to make contributions in kind (maintenance of databases, of collections, collecting, etc.)

Considering the role played by ECP/GR in the previous 15 years, and recognizing its new objectives and operational structure, the International Technical Conference on plant genetic resources held in Nitra, Slovakia, in Sept 1995, recommended that ECP/GR, based on active national programmes, be used as the platform to facilitate the implementation of the Global Plan of Action (GPA) for the European region as part of the FAO Global System on plant genetic resources (IPGRI/FAO 1996).

Phase VI (1999 – 2003)

The European Symposium on the implementation of the GPA in Europe held in Braunschweig, Germany in Oct 1998, made several recommendations for ECP/GR to expand its scope, to cover a wide range of the priority activities defined by the GPA. However, it was impossible to secure a proportional increase of the annual country contributions. Nonetheless, during Phase VI, the number of working groups expanded to 15 and activities were started in all the thematic groups, coordinated by appropriate task forces. The frequency of meetings of each working group was consequently reduced and an attempt was made to increase coordination at the network level with the establishment of network coordinating groups, composed of working

group Chairs, Vice-Chairs and database managers. The structure of ECP/GR at the end of Phase VI, showing all the active networks and working groups is shown in figure 2.

Table 1 shows how the 5 years budget of Phase VI is broken down in percentage for the different budget items. Although the cost of coordination is significant, it can be argued that this is an essential element to ensure cohesion and functionality of the programme.

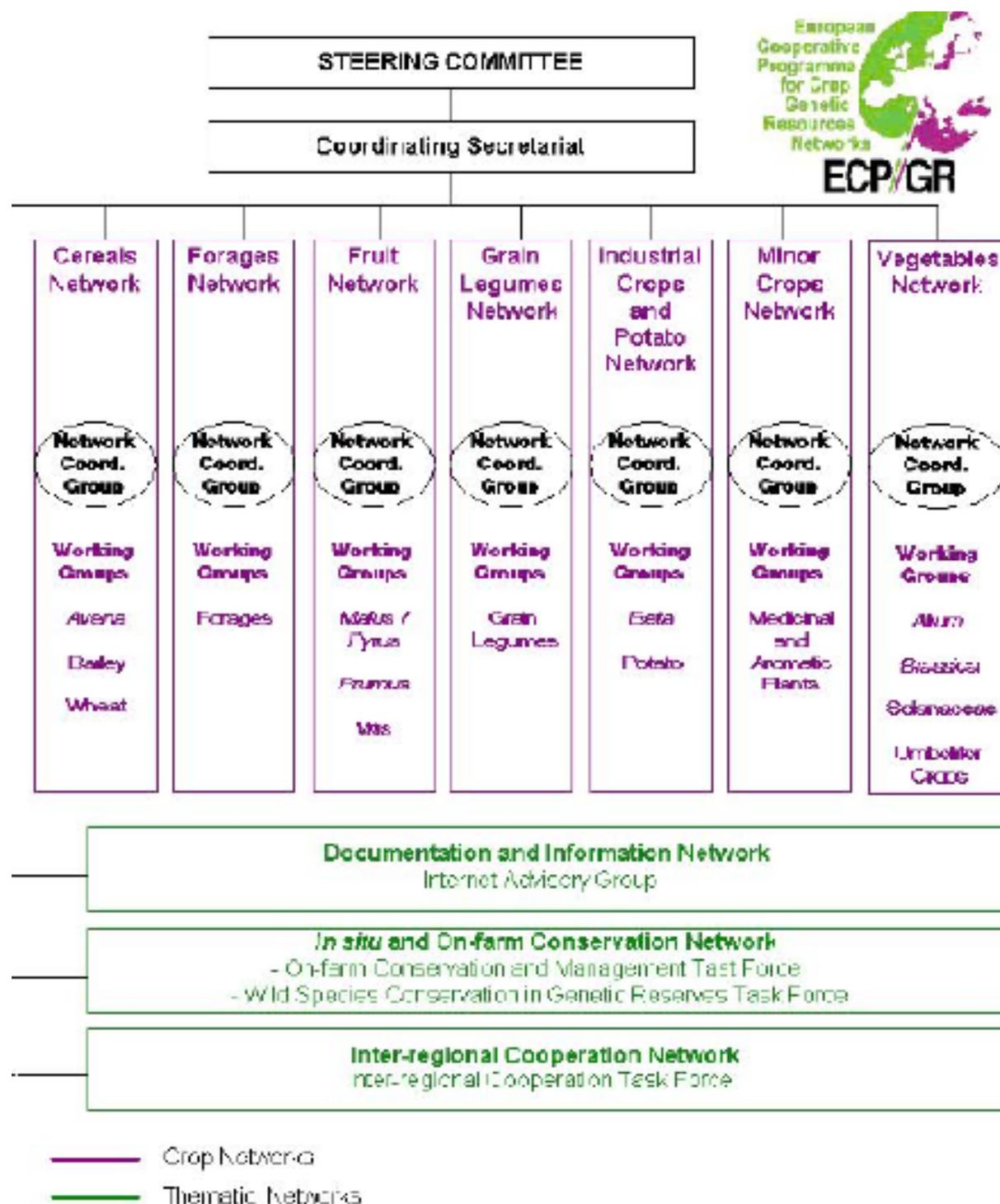


Figure 2. ECP/GR structure at the end of phase VI

Table 1. ECP/GR budget for Phase VI: 350,000€/year

Budget item	%
Coordinator at IPGRI and secretarial support	36.0
Staff travel	3.5
Network operations (meetings, <i>ad hoc</i> actions)	32.0
Steering Committee meetings	5.0
Internet platform	2.0
Publications	6.0
Newsletter	1.0
Communications and office consumables	3.0
Overheads	11.5

ECP/GR outputs

The success of the ECP/GR programme can be measured against indicators such as the:

- increasing number of participating countries (35 in 2002)
- continuing financial support from the members
- increasing request for the establishment of working groups (15 approved at the end of Phase VI).

It is not always possible to clearly attribute all the achievements resulting from collaborative initiatives on plant genetic resources in Europe to ECP/GR, although it can be assumed that the programme has been instrumental in establishing a fertile environment for cooperation. On the other hand, several outputs exist that can be clearly considered the result of ECP/GR and these are summarily described in the following sections.

Documentation

The ECP/GR networks have established nearly 50 central crop databases (table 2). These are managed as 'input in kind' to the ECP/GR by 32 institutes from 19 countries. The databases have the dual role of providing users with information on the germplasm maintained in Europe and providing the working groups with a tool allowing them to take informed decisions on the management of the collections (rationalization, safety-duplication).

Table 2: ECP/GR Databases

Cereals	Grain Legumes	Vegetables	Fruit	Forages	Industrial crops
<i>Avena</i> Barley Maize <i>Secale</i> <i>Triticale</i> Wheat	<i>Arachis</i> <i>Cicer</i> <i>Glycine</i> <i>Lens</i> <i>Lupinus</i> <i>Phaseolus</i> <i>Pisum</i> <i>Vigna</i>	<i>Allium</i> <i>Brassica</i> <i>Cucurbita</i> <i>Cyphomandra</i> Eggplant <i>Lactuca</i> <i>Physalis</i> Tomato Umbellifers	<i>Malus</i> <i>Prunus</i> <i>Pyrus</i> <i>Ribes/Rubus</i>	Legumes – 7 Grasses - 11	<i>Beta</i> Flax Potato (cultivated) Potato (wild)

Several databases still provide only passport data. These are, however, increasingly standardized, since all the networks have adopted the use of the IPGRI/FAO multicrop passport descriptors, following their approval, as a standard format for data exchange, in a meeting of

the ECP/GR Documentation and Information Network (Lipman et al. 1997). Many groups agreed to expand the list of descriptors for data exchange and include minimum lists of characterization and evaluation data. Since 1997, the European databases have become more visible on Internet (<http://www.ipgri.cgiar.org/links/selectcrop.asp>). Most of them are now accessible through entry pages based on a common logic. These provide links to on-line searchable or downloadable files and provide descriptions of the database and contact details of the contributors and of the managers. The Web-enabling of the ECP/GR databases was facilitated by a group of experts from the main documentation support centres in Europe, who provided advice and technical support to the European central crop database managers. The high level of collaboration has allowed several databases; each managed by a different institution, to be temporarily hosted on the servers of the Nordic Genebank or the German Centre for Documentation and Information in Agriculture (ZADI).

The ECP/GR Documentation and Information Network has been instrumental for the preparation of the EU-funded project EPGRIS (European Plant Genetic Resources Information Infra-Structure, <http://www.ecpgr.cgiar.org/EPGRIS/Index.htm>). This project was meant to support the creation of national plant genetic resources inventories in all the European countries. These inventories, to be implemented as part of the Clearing House Mechanism of the Convention on Biological diversity, will be the preferential source of data for the creation of the European Internet Search Catalogue (EURISCO). This catalogue, to be launched at the end of 2003, is planned to be frequently and automatically updated from the national plant genetic resources inventories and easily accessible through the Internet. The aim is to offer a single entry point guiding the user to the plant genetic resources information.

Information gathering and distribution

Another visible output of ECP/GR is the production of information on plant genetic resources, mainly as a result of the exchange of information catalyzed by the working group meetings. The production of meetings' proceedings, including reports on country collections, as well as technical information and results of research, has characterized the entire ECP/GR cycle. These publications, available in paper copy free of charge from the Secretariat, can increasingly be downloaded from the Internet. The ECP/GR web site is also increasingly becoming a reference for information on the programmes' activities (<http://www.ecpgr.cgiar.org>).

Characterization, evaluation and use of the collections

ECP/GR has rarely allocated its funds to specific activities, such as documentation, characterization or evaluation of the collections. Working groups have had to rely on their own national resources to carry out agreed priority activities. National resources were always scarce and would not allow speedy and uniform implementation of the collaborative work plans. However, the launching in 1994 of the European Council Regulation 1467/94 for genetic resources in agriculture offered a new source of funds that could be used in a complementary way to implement agreed working groups' work plans. Several ECP/GR working groups found themselves in the optimal condition to submit proposals on the range of activities that they had planned to carry out, but without adequate resources. A good number of projects (*Allium*, *Avena*, *Brassica*, barley, carrot, maize, *Prunus*), developed within the ECP/GR networks, received European Union's (EU) support and were able to rapidly improve the level of characterization and use of the respective European collections. To quote one example, the *Allium* project (1996 – 2000) resulted in the development of core collections for onion, leek and garlic, some sources of resistance to *Phytophthora* were identified in leek, and resistance to *Puccinia*, Thrips and downy mildew were identified in onions. It was interesting to note that other EU-funded projects that were not developed within ECP/GR circles (*Beta*, eggplant, potato, *Vitis*) decided to apply for the establishment of formal ECP/GR working groups, either in the course of the project period or after its end. This process once more showed the natural complementarity between the aggregative and coordinating potential of ECP/GR and the financial resources of the European Commission (EC).

A shortcoming of the EU-funded projects was the risk of splitting the ECP/GR groups, due to ineligibility of the non-EU countries for EU funds. In many cases, ECP/GR ensured the participation of non-EU partners in the meetings of the EU funded projects and occasionally enabled them with small resources to carry out complementary activities.

Conservation and exchange

According to the IPGRI directory of germplasm collections, about 500 genebanks and other institutes in Europe currently maintain *ex situ* a total of approximately 2 million germplasm accessions. Although difficult to quantify with accuracy, the level of duplication of the collections is thought to be high. On the other hand, there are still gaps in the collections and high priority regions (such as the Mediterranean, the Balkans, Carpathian, the Caucasus, etc.) have been identified for collecting landraces or wild crop relatives threatened by genetic erosion.

In the case of vegetables, there is no European country holding more than 30% of the total number of accessions held in Europe for a given crop. This shows that a high level of interdependence characterizes this region, and finding ways to share responsibilities and resources becomes imperative. Public funding for maintenance of the collections also often remains below a sustainable level.

Centralized collections on a crop-by crop basis, whereby partner institutions maintain a crop collection on behalf of the region have been established. Formal commitment to maintain these on behalf of ECP/GR countries have been made in the case of the seed *Allium* species and cruciferous crops collection in Wellesbourne, UK, the European field collection of long-day Alliums at Olomouc, Czech Republic, the European field collection of short-day Alliums at Rehovot, Israel, and the wild Brassicas and related wild relatives collection in Madrid, Spain.

Several ECP/GR working groups have also considered the possibility of formalizing decentralized European collections, with the responsibility for conservation of relevant accessions being distributed among several countries. Theoretical mechanisms to implement such a system have been formulated by the working groups. The groups have also constantly contributed to improve mutual trust among the partners, by ensuring continuing access to all germplasm and related information, and promoting the use of high technical standards for storage, conservation, evaluation and documentation. Agreements for safety-duplication of the collections, mutual support for emergency regeneration and reconstruction of lost collections have also been concrete examples of responsibility sharing promoted by ECP/GR. A detailed account of the recent debate within ECP/GR and progress in sharing responsibilities for conservation can be found in Maggioni (2001).

Conclusions

Twenty-two years after its establishment, the ECP/GR network can be said to have offered a successful framework for cooperation in Europe. This has facilitated maintenance of an open and continuous access to germplasm and related information. The most evident result of the network's presence has been improved documentation of germplasm and availability of data in the European region. Appropriate maintenance of the collections has also been encouraged.

One of the main strengths of ECP/GR has probably been the sense of ownership that it has been able to develop in all the member countries. The frequent occasions for meetings that it has created have facilitated continuous renewal of the commitment to work in collaboration and has also made it easier to prepare joint project proposals for submission to funding agencies. An effective coordinated Secretariat is thought to have acted as an essential glue of the network, but this would not have been sufficient without a clear commitment from the partners and their availability to contribute with inputs in kind.

Weaknesses of the programme can be identified in the often-insufficient availability of funds to implement joint activities, leading to the risk that these only remain written on paper. Moreover, success leading to expansion of activities may bring the risk of stretching the programme beyond its possibilities. The enthusiasm and good will originating in the working groups might also bring a sense of frustration whenever implementation of technical decisions is slowed down by the need for governmental approval.

ECP/GR is getting closer to the definition of its seventh phase of operation. Though independent from the actual direction that the member countries will prefer to give to the programme, it is believed that the role of an effective Secretariat will still remain essential. Improvements will be expected if national programmes will be strengthened, since a coordinated approach can draw larger benefits when the basic elements of the system are strong and effective. It will also be important to maintain the focus on priority actions, so that the expected targets remain feasible. It is hoped that these considerations can be useful for any other regional network under development and that a coherent and efficient regional plant genetic resources strategy be promoted as a result of a well functioning networking environment.

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