



Item 7 of the
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IBPGR ACTIVITIES

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IBPGR ACTIVITIES

I. INTRODUCTION

1. In March 1972, the Technical Advisory Committee of the CGIAR convened a Working Party, in Beltsville, USA, to consider an FAO proposal to establish a network of genetic resources centres, located in the centres of diversity of plant germplasm. Further negotiations between the CGIAR and FAO resulted in an agreement to establish instead the International Board for Plant Genetic Resources (IBPGR) as an independent center, of the Consultative Group of the International Agricultural Research (CGIAR). Members of the CGIAR approve the programme\$ and budgets of IBPGR, provide funds for IBPGR core programme and monitor progress through periodic reporting to the Technical Advisory Committee (TAC) and external reviews.

2. The IBPGR headquarters were to be in FAO, Rome, so that FAO could provide IBPGR's central coordinating staff, as well as operational support to the new organization. This proposal was endorsed by the FAO Conference in 1973, and the FAO staff working on plant genetic resources became the Secretariat of IBPGR. For almost 12 years, 1974-1985, the FAO and IBPGR programmes were considered as a co-terminous: the Executive Head of IBPGR also served as Chief of the FAO Crop Genetic Resources Centre (AGPG). This dual responsibility, and access to the FAO administrative system, both at headquarters and in the field, provided part of the operational support that IBPGR activities needed, particularly in the developing countries. In addition, FAO, as an intergovernmental organization, provided the necessary institutional framework for IBPGR's field programme. This cooperation helped IBPGR to develop an effective programme of action for the conservation of plant genetic resources. Following the external (CGIAR) review in 1985, IBPGR has been evolving into a more autonomous centre with an expanded programme and staffing. The relationship between FAO and IBPGR accordingly changed, and a Memorandum of Understanding (MOU) was therefore signed in February 1987. The Director of the Plant Production and Protection Division continues to be an ex-officio member of the Board of the IBPGR. He is also a member of the Programme Committee. This included an agreement that IBPGR assumed the costs of all of its staff. A revised MOU was signed in 1988. IBPGR will, from the beginning of 1989, meet part of the overheads of being hosted in FAO headquarters, which until now has been met by FAO.

3. IBPGR's priorities are established by its Board of Trustees, As an independent non-governmental organization, IBPGR's priorities do not necessarily coincide with those decided by FAO's Governing Bodies. However, in particular because of the existence of the CPGR, this need not lead to overlapping between the IBPGR and FAO programmes, as the CPGR is oriented mainly towards policy issues, with emphasis on the political and legal aspects of plant genetic resources, which are factors which cannot be addressed by IBPGR.

4. According to its terms of reference, the CPGR (a) recommends measures that are necessary or desirable for ensuring the comprehensiveness of the global system for plant genetic resources and the

efficiency of its operation which obviously includes the avoidance of duplication; and (b) the CPGR also reviews the policy, FAO's programmes and activities in the field of plant genetic resources, and when appropriate advises the Committees of Agriculture and Forestry. The CPGR can thereby ensure complementarity and avoid duplication of the FAO programme with IBPGR activities. In line with this, and with the recommendations of the first two meetings of the Commission, the FAO programme related to the conservation and utilization of plant genetic resources has given priority to promote, stimulate and provide technical assistance for activities on species and in regions that are not adequately covered by other international organizations, especially IBPGR. This includes local crops of social and economic importance, in situ conservation, the agronomic evaluation and utilization of germplasm, strengthening national capabilities for germplasm preservation, plant breeding and seed production. Details are provided in documents CPGR/89/5 and CPGR/89/9.

5. On an operational level, the CPGR will continue to liaise with IBPGR and other CGIAR Institutes, UNEP, Unesco, IUCN, the WWF and other governmental and non-governmental organizations working on genetic conservation and utilization, and will take whatever steps are necessary to harmonize their efforts in the field of plant genetic resources.

II. THE IBPGR PROGRAMME ^{1/}

6. IBPGR is not a technical assistance organization. Its funds are to be used to implement a global programme based on international scientific priorities. The funds are used to initiate urgent scientific work and to fill important gaps. In doing this there is an element of technical assistance, but this is very largely the responsibility of the multilateral agencies and bilateral donors. In addition, IBPGR is charged with establishing and sustaining a truly global programme spanning all countries of the world, whether developing or developed. Its medium-term aim is to transfer technology and provide training to the developing countries and to initiate strategic research which will enable new technologies to be developed so that a wide spectrum of diversity of gene pools is collected, conserved and used.

7. IBPGR's action is related specifically to crop plants at the request of the CGIAR. It does not deal with forest species nor a host of minor species although it is set up to take on additional priority work on special project funding if such work is justified. IBPGR stresses the need for conservation and use of wide diversity and, on scientific grounds, deals with landraces and related wild species since these contain that diversity.

8. IBPGR has, over the past three years, embarked on a new course following the identification of important new directions. The changes in programme activities are now clear and some initiatives have already been taken; others are more at the formative stage. The programme and budget plans for the medium-term reflect the changes and have been approved by CGIAR for 1989-93.

^{1/} Part II (paras. 6 to 19) is provided by IBPGR and briefly outlines the activities that were carried out during the past three years and also the future programme of work for the next five years (1989-1993).

9. IBPGR's programme is based on international priorities for agricultural research established by the TAC. The recent reorganization of the centre over the past two years has resulted in the assemblage of a team of scientific staff which enables the centre to undertake - in-house - much of the work previously assigned to committees, working groups and other sources of expertise. This tightens up the coordinating role of IBPGR and ensures greater effectiveness since the numbers of partners with which IBPGR works has grown at a rapid rate, which could not have been envisaged even ten years ago.

10. IBPGR, within the CGIAR, works in cooperation with the commodity IARCs. It has always been recognized by IBPGR that the IARCs should form major elements in the global system of genetic resources centres for their mandated crops. However, IBPGR's remit is much wider in terms of the crops with which it deals - and the policy of working with other CGIAR Centers always aims at complementarity and the avoidance of duplication. As cooperative modes evolve, the relative roles of IBPGR and the commodity centres emerge and have been addressed by the CGIAR Center Directors and the TAC.

11. The programme of IBPGR is divided into three sections which provide for clearly defined field, research and administrative programme elements operated from the Headquarters and a series of field offices located in areas of the world that provide access to centres of diversity of crop germplasm and to partner centres and countries. At present there are field offices in Rome, (for the Mediterranean and South West Asia), New Delhi, India (for South and South East Asia), Beijing, China (for East Asia), Nairobi, Kenya (for Eastern and Southern Africa), Niamey, Niger (for West Africa), Londres, Mexico, and Cali, Colombia (both for Latin America). The Field and Research Programmes are summarized below:

The Field Programme

12. The Field Programme is divided into a number of specific elements, but basically is coordinating: (i) the development of and support to national programmes, and (ii) the development of crop-specific networks. Two major elements represent support to the ex situ collections which hold the germplasm. Here, the emphasis is on the collections of a specific crop rather than on the genebank per se. IBPGR's major concern is to improve scientific and management standards, particularly those of base collections because their main purpose is to ensure germplasm security. Active collections pose more operational, managerial and scientific problems because on the one hand they are so numerous and on the other their range of activities is diverse. IBPGR is now entering a phase where a conceptual framework for germplasm collections requires clearer definition of scientific and practical arrangements for linkages between collections in crop networks.

13. The Field Programme is backed by four other activities:

(i) Collecting:

Since so much has been done in the recent past, IBPGR now targets its efforts specifically to collecting material known to be under threat and for which an alerting system is being implemented by Field Staff to keep genetic erosion under review. In addition, targets are made for collecting to fill gaps in diversity in existing collections. Transfer of collected germplasm to genebanks has left a lot to be desired in the past and IBPGR has now established two distribution centres to ensure that collected samples can be cleaned, dried, and packaged for deposition - with supporting data - into the genebanks. These serve Africa and Asia. Plans are underway for a third to serve Latin America.

(ii) Conservation:

Conservation may be ex situ or in situ, IBPGR deals largely with ex situ conservation. Ex situ conservation utilizes genebanks, whether for seed or vegetative material or in vitro material. The technology is now well known for seeds which can be stored dry at low temperatures and IBPGR has been instrumental in seeing that suitable genebanks are established. Seed storage can be for long periods (base collections) or for shorter periods (active collections). To provide an element of security, IBPGR has sought the agreement of institutions to hold base collections of particular crop gene pools on behalf of the wider community. Currently thirty nine institutions hold material of the major crop and forage species of interest to food production in base collection. These institutions do not routinely distribute materials; this is done from active collections linked to the base collections. IBPGR's strategy is to see that materials are duplicated enough times to ensure availability. The base collections are more or less equally divided between the developed and the developing world and IBPGR has not received any documented example of the non-availability of stored genetic material of primitive forms of food crops.

Vegetative collections as plantations or orchards are active collections, not base. They would be under less threat of loss if transferred to in vitro collections when the appropriate technology has been developed and cryopreservation provides a hope that these can be transferred to base collections.

(iii) Characterization/documentation:

Much of the increased effort on characterization and documentation will be directed to the development of specific crop databases. It has been noted that these databases serve

user needs far better than, cores of institutional multi-crop databases. At the same time, and in order to promote the more effective use of resources, IBPGR is actively pursuing the idea of selected cores or subsets within the large germplasm collections, based on ecogeographic origins and subsequent descriptions.

(iv) Training:

The increased effort on human resources development will continue to emphasize the need for specialized training to provide the conceptual, technical and management skills to meet the essential needs of national programmes. IBPGR is currently addressing two areas of expansion; first, wider training in languages other than English and such training where possible to be located in developing countries, and second, the need to retrain the current core of past trainees to update skills due to rapidly changing technology.

The Research Programme

14. The research agenda over the next five years comprises a number of initiatives in several specific areas. To explain the rationale of research support to conservation technology - seeds and in vitro - it is useful to re-emphasize that plant genetic diversity can be conserved in a number of complementary ways and there should be a strategy for each crop gene pool. For any one crop several methods may be applicable. Most staple food crops, vegetables and forages, can be conserved effectively as seed and, indeed, seed is the preferred method because the technology is tried and tested.

15. Seed conservation technology still requires research, especially to seek and implement more cost-effective methods. At the same time, the genetic stability of stored seeds is in urgent need of research and acceptable levels of genetic change need to be determined.

16. For many vegetatively propagated crops, there is the need to conserve unique clonal genotypes. Such materials are kept as growing plants in field genebanks or maintained in vitro. The possibility of in vitro conservation has attracted the genetic resources community for some time but current methods are generally at the developmental stage and where they are available they are restricted to use for storage in the short-to-medium-term. Research on cryopreservation offers the best potential for long-term conservation of vegetative material. IBPGR has researched the conceptual framework for the management of long- and medium-term in vitro genebanks and the principles are currently under test in a pilot in vitro active genebank before downstreaming to national programmes for specific crops.

17. Pathological aspects of germplasm conservation have received inadequate attention in the past. Two elements of IBPGR's current programme, one related to seeds and one to in vitro cultures, are linked to very new and path-breaking research using modern biotechnological

methods. IBPGR has assumed a much stronger role in considering disease indexing and movement of germplasm. Viruses and viroids present major problems, acutely so for vegetative and in vitro materials. Recently, IBPGR developed the conceptual framework for a totally enclosed quarantine system of which a component is disease indexing. This research activity is being backed by an agreed cooperative IBPGR-FAO initiative to examine, on a crop basis, the diseases and known and reliable indexing methods. In the case of seeds there are strong reasons to use methods which avoid destructive seed testing.

18. IBPGR has faced major constraints in implementing the collecting of diversity from the wider genepools due to inadequate knowledge on wild species distributions, breeding systems and species relationships. Although the newer biochemical and molecular techniques are applicable in this area, they are both expensive and time-consuming and, in many cases, still in the developmental stage. Despite the whole question of biodiversity attracting wide international interest, in practice, little funding is channeled to research on crop genepools. Genetic diversity research is now included in IBPGR's programme.

19. IBPGR contracts its strategic research to institutes with expertise which can provide inputs in kind thereby obviating the need for IBPGR to provide more than additional personnel and minimal equipment. Such contracts can be in any part of the world and IBPGR's aims are to develop technologies for rapid transfer to developing countries and to link developing countries to such research. This mode of operation is fully endorsed by the CGIAR.

III. INTER-RELATIONSHIP BETWEEN IBPGR AND FAO AND COMPLEMENTARITY OF THEIR RESPECTIVE ROLES

20. Specific areas where cooperation exists between FAO and IBPGR or could be developed, include the following:

(i) The FAO/IBPGR Newsletter on Plant Genetic Resources

FAO also has continuously promoted and undertaken the dissemination of information on plant genetic resources. It began publishing the FAO Plant Introduction Newsletter in 1957. In 1971, this became the Plant Genetic Resources Newsletter, which, since 1974, has been published jointly with IBPGR.

(ii) Information and documentation of plant genetic resources

Article 7.1(e) of the Undertaking requested FAO to develop a global information system. As detailed in CPGR/89/5, FAO plans periodically to produce a "State of the World on Plant Genetic Resources" that will be presented to future sessions of the Commission. The CPGR Secretariat is also compiling information on the genetic resources programmes of FAO member nations. A methodology is being developed to obtain and analyze the annual reports made by countries adhering to the International Undertaking, pursuant to article 11. The assistance of IBPGR and other CGIAR Centres will be extremely valuable in this field. The IBPGR and the other IARCs will be able to benefit from the information contained in the countries' annual reports and from the deliberations of the Commission.

FAO and IBPGR continue to develop data bases and information systems which are in many respects complementary. The Seed and Plant Genetic Resources Service (AGPS) of FAO has over the years developed a Seed Information System (SIS) to facilitate the exchange of germplasm. This system provides information on varieties of the major crop species including data on their morphological, ecological and agronomic characteristics; it is being expanded to include also land races and the wild relatives of species not covered by IBPGR. Similarly, IBPGR is developing crop data bases which, in the majority of cases, provide passport information with little or no agronomic data. IBPGR is also building up a database of "country profiles", which includes information on the institutions and personnel actively involved in plant genetic resources work in each country, and this could be an area for cooperation.

(iii) Safe conservation and free availability of germplasm collections

IBPGR has sought to make agreements whereby a number of institutions are designated to hold base collections on behalf of the International community. However and because of the non-governmental nature of IBPGR this base collection network has no formal legal status, but relies upon bona fide commitments. To implement article 7.1(a) of the International Undertaking, FAO has proposed a variety of models, distinguished largely by the degree of international control which the government in question accepts, whereby governments may hold germplasm on behalf of the international community. Those governments and institutions which wish to do so may place all or part of the base collections in their genebanks under the auspices or jurisdiction of FAO. In this context, there is complementarity not duplication, between FAO's and IBPGR's efforts, as nothing impedes governments holding base collections designated by IBPGR from formalizing their commitment through FAO. In this cooperative effort, IBPGR can play an important role by overseeing and monitoring the scientific and management standards of base collections, while FAO provides the legal umbrella. Further details on this subject are provided in documents CPGR/89/4 and CPGR/89/7.

(iv) Transfer of germplasm

Over the years, FAO has developed an international programme to facilitate the exchange of seed samples and their propagating materials for use by breeders and agronomists. From time to time IBPGR uses this facility for transfer of germplasm that has been collected to its designated base collections. In 1987 alone, 34,604 samples of various crops were dispatched to more than 100 countries through the FAO Seed Laboratory. This facility will continue to be used to distribute germplasm to genebanks and research institutes.

Within the context of the International Plant Protection Convention, FAO and IBPGR have also initiated a cooperative programme to facilitate the safe and expeditious transfer of germplasm, through the publication of a series of crop-specific protocols and guidelines, which describe disease indexing, and other procedures for use by quarantine officials and scientists involved in the exchange of plant germplasm.

(v) National Councils or Committees

The Commission, at its Second Session, recognized the need for the establishment of national councils or committees on plant genetic resources, in which a number of institutions and disciplines might participate, and to promote the development of national structures able to safeguard the country's plant genetic resources. A few countries have already set up such national councils, boards, or committees. FAO and IBPGR might jointly pursue this matter, and encourage additional countries to establish functioning and adequate national structures.

(vi) Technical assistance

FAO and IBPGR, both recognise the very great needs of many developing countries for technical and financial assistance to set up and strengthening national programmes for conservation and utilization of plant genetic resources. Much of this must be provided through projects, and in order to effectively mobilize bilateral and multilateral assistance, well prepared project proposals are essential. FAO and IBPGR should assist each other in formulating, operating and overseeing specific projects.

21. Beyond the specific areas of cooperation mentioned above, the existing international structures concerned with plant genetic resources offer rich opportunities for convergence of effort and the optimal use of human, natural and financial resources towards a common goal of the conservation and proper utilization of plant genetic resources. The CPGR can draw on the information, expertise and scientific advice of IBPGR and other IARCs. They, in turn, can benefit from the views and recommendations of the governments represented in the CPGR. The FAO and IBPGR work programmes can not only avoid duplication but can achieve a high degree of cooperation and synergy to the ultimate benefit of mankind.