International Treaty on Plant Genetic Resources for Food and Agriculture: An Assessment

RP Dua, Pratibha Brahmi and BS Dhillon
National Bureau of Plant Genetic Resources, Pusa Campus, New Delhi - 110 012

The sustainable use of plant genetic resources (PGR), has been a common concern of humankind. The conservation and sustainable use of PGR is of critical importance for meeting the food, health and other needs of the growing world population. Earlier PGR were considered a common heritage of mankind and were freely available for acquisition and utilization, but with the Convention on Biological Diversity (CBD) coming into force with effect from December 29, 1993, the sovereign rights of the nations over their biological resources have been recognised and the nations are responsible for conservation of biological diversity and using it in a sustainable manner. The access to and sharing of both, genetic resources and technologies, are essential, as most of the countries depend largely on PGR for food and agriculture that originated elsewhere. Nations may, therefore, mutually benefit from creation of an effective system for facilitated access to these resources, while exercising their sovereign rights over their plant genetic resources for food and agriculture (PGRFA). It was, thus considered appropriate to formulate an international agreement within the frame work of the Food and Agriculture Organization (FAO) of the United Nations to achieve the objectives in harmonization with the provisions made under CBD. After years of negotiations, a treaty named "International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) was adopted in November, 2001 at the 31st Conference of the UN Food and Agricultural Organisation (FAO, 2001).

Genesis of the Treaty

In 1983, the FAO Conference established the inter-governmental Commission on Plant Genetic Resources (now the Commission on Genetic Resources for Food and Agriculture) and adopted a non-binding International Undertaking (IU) on Plant Genetic Resources. The objectives of IU were to ensure that "PGR of economic and or social interest, particularly for agriculture will be explored, preserved, evaluated and made available for plant breeding and scientific purposes" This undertaking was based on the universally accepted principle that PGR are a heritage of mankind and consequently should be available without restriction.

After 1993, when CBD was adopted during Rio Earth Summit of the United Nations, the authority to determine access to genetic resources became the responsibility of national governments, which was to be determined on the principles of prior informed consent (PIC) and mutually agreed terms (MAT).

In 1993, the FAO adopted a resolution (7/93) for the revision of IU to bring it in harmony with CBD, and to address other outstanding issues of access to PGR held in *ex situ* collections by Consultative Group of International Agricultural Research Centres (CGIAR), and the realization of farmers rights. These issues were not addressed by IU earlier.

The revised text of IU was submitted to the FAO Conference on 3rd Nov, 2001 and adopted as "The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).

Salient Provisions

Objectives of the Treaty: The objectives of the Treaty are "the conservation and sustainable use of PGRFA and the fair and equitable sharing of benefits arising out of their use, in harmony with the CBD, for sustainable agriculture and food security". The objectives are proposed to be attained by closely linking this Treaty to the FAO of the United Nations and to the CBD.

Entry and termination of the Treaty: The Treaty was open for signature at the FAO from 3 November 2001 to 4 November 2002 by all members of FAO and other states that are not members of FAO but are members of either the United Nations, or any of its specialized agencies. However, this Treaty is subject to ratification, acceptance or approval by the members and non-members of FAO as referred above. The Treaty shall come into force on 29th June 2004, after 90 days of the deposit of the 40th instrument of ratification and acceptance[1].

A contracting party at any time, after two years of the Treaty coming into force, may notify in writing for its withdrawal from the Treaty. The withdrawal shall be effective after one year of receipt of the notification. The Treaty shall be automatically terminated if and when,

as a result of withdrawals, the number of contracting parties drops below forty, unless the remaining contracting parties unanimously decide otherwise. In the event of termination the disposition of assets shall be governed by the financial rules to be adopted by the Governing Body.

Relevant terms in the Treaty: For the purpose of this Treaty, some important terms have been defined as follows:

- "*In situ* conservation" means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated plant species, in the surroundings where they have developed their distinctive properties.
- "*Ex situ* conservation" means the conservation of plant genetic resources for food and agriculture outside their natural habitat.
- "Plant genetic resources for food and agriculture" means any genetic material of plant origin of actual or potential value for food and agriculture.
- "Genetic material" means any material of plant origin, including reproductive and vegetative propagating material, containing functional units of heredity.
- "Centre of origin" means a geographical area where a plant species, either domesticated or wild, first developed its distinctive properties.
- "Centre of crop diversity" means a geographical area containing a high level of genetic diversity for crop species in *in situ* conditions.

Obligations on part of Contracting Parties

Each contracting party of the Treaty shall ensure the conformity of its laws, regulations and programmes with the provisions of the Treaty. Each contracting party shall, subject to national legislation, and in cooperation with other contracted parties where appropriate, promote an integrated approach to the exploration, conservation and sustainable use of PGRFA and shall in particular, as appropriate, undertake some of the activities like:

(i) Survey and inventory of PGRFA;

(ii) Promote the collection of PGRFA and relevant associated information on those PGR that are under threat or are of potential use;

(iii) Promote or support, as appropriate, farmers and local communities' efforts to manage and conserve on-farm their PGRFA;

(iv) Promote *in situ* conservation of wild crop relatives and wild plants for food production;

(v) Cooperate to promote the development of an efficient and sustainable system of *ex situ* conservation, giving due attention to the need for adequate documentation, characterization, regeneration and evaluation;

(vi) Take steps to minimize or, if possible, eliminate threats to PGRFA.

The contracting parties are also obligated to develop and maintain appropriate policies and legal measures to promote sustainable use of PGR for sustainable agriculture and food security, and international cooperation, in the following manner.

(a) At national level by

(i) development and maintenance of diverse farming systems;

(ii) strengthening research which enhances and conserves biological diversity by maximising intra and inter specific variation;

(iii) promoting breeding efforts for development of varieties adapted to social, economic and ecological conditions;

(iv) broadening genetic base of crops;

(v) promoting locally adapted crops and varieties;

(vi) supporting the wider use of diversity of varieties and species in on-farm management;

(vii) reviewing policies for varieties release and seed production as appropriate

(b) At the international level by

(i) cooperating with other contracting parties, directly or through FAO and the relevant international organizations in the conservation and sustainable of PGRFA.

(ii) cooperating in establishment or strengthening the capabilities of developing countries and countries with economies in transition with respect to conservation and sustainable use of PGRFA.

The Multilateral System of access and benefit sharing

In exercise of sovereign rights of nations over their plant genetic resources for food and agriculture, the Treaty envisages the establishment of a multilateral system (MS) covering a list of 35 food and 29 forage crops (Annexure 1 of the Treaty) selected on the criteria of food security and interdependence. It shall include all PGRFA of the listed crops that are under the management and control of the contracting parties and in public domain. The

contracting parties shall also take appropriate measures to encourage national and legal persons within their jurisdiction, holding PGRFA of the listed crops, to include such PGRFA in the MS. The MS shall also include the PGRFA as listed, and held in the ex situ collections of the International Agricultural Research Centres of the CGIAR.

The access to PGRFA shall be provided solely for the purpose of utilization and conservation for research, breeding and training for food and agriculture, provided that such purpose does not include chemical, pharmaceutical and/or other non-food/feed industrial uses (Article 12.3 a). The access is to be accorded expeditiously without the need to track individual accessions and either no fee or fee, not exceeding the minimal cost involved, is to be charged. It is also envisaged in the Treaty that all the available passport data, subject to applicable law, and any other associated available non-confidential descriptive information should be made available with PGRFA being provided. However, as per Article 12.3 (d), the recipient shall not claim any intellectual property or other rights that limit the facilitated access to PGRFA, or their genetic parts or components, in the form received from MS. The MS also makes it mandatory (Article 12.3 g) on the part of recipient to continue to make the accessed and conserved material available to MS.

Article 13 of the Treaty describes about the benefit sharing mechanisms in the MS. It has been indicated that the benefits arising from the use, including the commercialization of PGRFA under MS shall be shared fairly and equitably through different mechanisms like the exchange of information, access to and transfer of technology, capacity building, and the sharing of the benefits arising from commercialization, taking into account the priority activity areas in the rolling Global Plan of Action, under the guidance of the Governing Body.

Article 13.2 d (ii) of the Treaty states that "a recipient who commercializes a product that is a PGRFA and that incorporates material accessed from MS, shall pay to the mechanism, such as Trust Account, as referred in the Article 19.3 f of the Treaty, an equitable share of the benefits arising from commercialization of that product, except whenever such a product is available without restriction to others for further research and breeding, in which case the recipient who commercializes shall be encouraged to make such payment".

The facilitated access to PGRFA shall be provided in pursuance of standard material transfer agreement (MTA), which shall be adopted by the Governing Body and contain the provisions of the Articles 12.3 (a, d, g) and 13.2 d (ii) and other relevant provisions of the Treaty as referred above. The conditions of MTA shall also apply to the transfer of PGRFA to another person or entity, as well as to any subsequent transfers of these PGRFA.

It has been emphasized under the Article 13.3 of benefit sharing that the benefits arising from the use of PGRFA that are shared under MS should flow primarily, directly or indirectly, to the farmers in all countries, especially in developing countries, and countries with economies in transition, who conserve and sustainably utilize PGRFA. This component of Treaty will largely depend upon the effectiveness of implementation of the Global Plan of Action and the funding strategy, particularly for the developing countries and countries with economies in transition, especially in centres of diversity and the least developed countries.

Farmers' Rights

It has been very well recognized in the Treaty (Article 9) that the local and indigenous communities and farmers of all regions of the world, particularly those in the centres of origin and crop diversity have made enormous contributions and will continue to make for the development and conservation of plant genetic resources which constitute the basis of food and agriculture. The responsibility for realizing the farmers' rights related to PGRFA rests with the national governments and accordingly, as appropriate and subject to its national legislation, take measures to protect and promote farmers' rights with respect to (i) protection of traditional knowledge related to PGRFA, (ii) right to equitable share of the benefits arising out of use of PGRFA and (iii) the right to participate in decision making, at national level on matters related to conservation and sustainable use of PGRFA.

Also, the Treaty shall not limit any rights that farmers have to save, use, exchange and sell farm saved seed/ propagating material, subject to national law and as appropriate.

Supporting Components

Four major components supportive to the effective working of the Treaty have been recognized. These are:

(1) Effective implementation of Global Plan of Action (FAO, 1996), where 20 activities have been identified to be pursued through national actions.

(2) Recognising the importance of *ex situ* collection of PGRFA held in trust by International Agricultural Research Centres (IARCs) of the CGIAR with the Treaty, the Contracting Parties have called upon IARCs to sign agreements with the Governing Body with regard to *ex situ* collections listed as well as non-listed crops with certain terms and conditions such as:

(i) PGRFA listed in Annex 1 of the Treaty and held by the IARCs shall be made available as per standard MTA to be adopted by the Governing Body.

(ii) PGRFA not listed in Annex 1 of the Treaty and collected before CBD that are held by IARCs shall be made available as per MTA currently in use pursuant to the agreements between IARCs and FAO. The MTA shall be modified by the Governing Body not later than its second regular session.

(iii) The Contracting Parties in whose territory the PGRFA were collected from *in situ* conditions shall be provided with samples of such PGRFA on demand, without MTA.

(3) The existing cooperation in the international networks on PGRFA should be encouraged to be developed on the basis of existing arrangements and consistent with the terms of the Treaty.

(4) The contracting parties should cooperate in development and strengthening of a global information system to facilitate exchange of information, based on existing information systems, on scientific, technical and environmental matters related to PGRFA.

The Institutional and Financial Provisions

The Governing Body (GB) of this Treaty shall be composed of all contracting parties. All the decisions will be taken by consensus. The functions of the GB shall be to promote the full implementation of the Treaty keeping in view its objectives particularly, for the operation of MS and establishment of an appropriate mechanism, like as a Trust Account, for receiving and utilizing financial resources that will accrue to it for purpose of implementing this Treaty.

The Secretary of GB shall be appointed by the Director General of FAO, with the approval of the GB. The Director General of FAO shall be the Depositary of this Treaty.

For financial resources, the contracting parties have to make a funding strategy for the effective implementation of the Treaty. The funding strategy shall be to enhance the availability, transparency, efficiency and effectiveness of the provisions of the financial resources. To mobilize funds for priority activities, plans and programmes, in particular to the developing countries and countries with economies in transition, the GB shall periodically set targets for such funding. The effectiveness and efficiency in implementation of programmes and policies of the Treaty in building capacity in PGRFA in developing countries and countries with economies in transition will mainly depend on the effective allocation of funds by the Contracting Parties, particularly by the developed countries.

The other component of the funding strategy is to get revenue through the benefits arising out of the commercial utilization of PGRFA (Article 13.2 d). Voluntary contributions may also be provided by the Contracting Parties, the private sector, non-governmental organizations and other sources. The GB shall consider modalities of a strategy to promote such contributions.

Assessment and Perception of the Treaty

The International Undertaking (IU) adopted by FAO in 1983 came to a close when an international binding agreement "The International Treaty on Plant Genetic Resources for Food and Agriculture" was adopted. This treaty was necessitated to harmonize the provisions made under Convention on Biological Diversity (CBD) particularly with respect to the sovereign rights of the nations over their biological resources, fair and equitable sharing of the benefits arising out of the use of biological resources, facilitating access and conservation and sustainable use of biological resources. This has paved a way to understand the value of biological resources, and the significance of farmers and communities in the development and conservation of biological resources.

The Contracting Parties should see that the emphasis laid under article 7.2 (a) for the international cooperation to be mainly directed towards establishing or strengthening the capabilities of developing countries and countries with economies in transition, associated with centres of crop diversity should be carried out in letter and spirit so that the important objective of the Treaty to promote conservation of the PGRFA is not vitiated.

Concerns Regarding Conditions of Access: The issue related to access to PGRFA should be made clear on

the point (i) whether the material has to be accessed through a single window system (Nagamine, 2004) or (ii) it has to be at accessed directly from the concerned party.

It will be desirable if the access is made through single window system. IARC should sign the agreement with FAO, who will hold the material in trust and supply the materials to the indenting party through MTA. By this way, a uniform system will be developed for utilization of biological resource under the MS.

Crops and forages covered: In the agreement arrived at, after consideration of various thoughts, where some countries wanted every crop to be brought under MS, the biodiversity-rich developing world managed to keep back some valuable crops from the common system. India favoured retaining all crops dealt under CGIAR system. Ultimately, it was agreed to included the selected crops based on food security and interdependence amongst countries. The 35 food crops and 29 forages (listed in Annex 1) were selected. This list represents about 85 percent of the crops important for food security. However, there seems to be some major gaps in the list, if the criteria of food security is considered. Crops like soybean, groundnut, sugarcane tomato and most tropical forages are excluded, while asparagus and strawberry are included (Fowler, 2004).

Regarding the number of crops and forages, there are apprehensions. Some countries feel it to be exhaustive, while others have rated them to be a low number (Chawdhary, 2002). To add crops and forages to the list will be a matter of 'amendment' now, which can be proposed once the Governing Body is established. But that too will not be a easy job since the amendment need to be approved by all, due to the 'consensus' clause of the Treaty.

The fear of biopiracy expressed by the author (Chawdhary, 2002), about the uncovered crops seems to be unfounded. The author had expressed that the Treaty may increase the threat to the diversity of genetic resources, escalate biopiracy and inactivate identification, collection, documentation and conservation of PGR excluded from MS. But, It has been reaffirmed under CBD as well as in the Treaty that the states have sovereign rights and are responsible for conservation and sustainable use of their biological biodiversity with a fair and equitable sharing of benefit arising from use of the genetic resources. This leaves no scope for such suspicions. Accordingly, the Biological Diversity Act 2002 has been passed in India and access to PGR by foreigners would be as per provisions of the Act. The access and regulations of PGR for each and every crop will be controlled by National Biodiversity Authority. Apart from this, the ex situ collections of all the crops held in trust by IARCs are to be supplied as per the standard MTA which forbids applying for any IPR over the acquired germplasm.

Provision of Farmers Rights and Intellectual Property Rights: The holders of biological resources have taken a right step in bringing only those crops and forages under the Treaty which are important for food security and interdependence of many countries. The other crops and forages would either be, handled through bilateral agreements or amendments made in the Treaty at later stages. The main aspect where conflicts or the differences of opinions have surfaced are the Farmers Rights, benefits sharing and the IPRs related to biological resources. The Treaty clearly envisages the farmers rights under Article 9 with respect to protection of their traditional knowledge, right to equitable sharing of use of PGRFA and their participation in decision making related to PGRFA conservation and sustainable uses. Article 13.3 states that the benefits sharing from the use of PGRFA should primarily, directly or indirectly, flow to farmers. But the responsibility of all these aspects rests with the national governments, who have to make laws, plans and policies in cognizance of these issues. This may be possible at the national level but there should be a commitment from the international agency like FAO to take care of these issues of the international level also, since the Treaty allows claiming IPRs, if not in their original forms, but on their modified forms, as could be interpreted from the Article 12.3 (d) that mentions as not to claim any IPR "in the form received". Since patents are being allowed on the processes of varietal development and even for a 'gene' extracted from a plant in some developed countries, the commercialization aspect definitely creeps in and therefore, the authority at the international level should see how to extract claims of benefit sharing arising out of use of the biological resources.

Involvement of Private Sector towards benefit sharing: Value addition being an important component of PGRFA, it would be desirable to involve private sector and food industries to exploit the commercialization aspect of PGRFA to the fullest extent to take advantage of benefit sharing and enhance the allocation to the funding strategy, as provided in Article 13.6, where the contracting parties are advised to consider modalities for voluntary benefit

sharing contributions by food processing industries that benefit from PGRFA.

Conclusion

The PGRFA are the most essential component of food security, the world over. As most of the countries largely depend on the PGRFA that originated elsewhere, it is necessary to make provisions for the access and sharing of PGRFA at the global level. The recognition of sovereign rights of the nations over their genetic resources, after adoption of CBD in 1993, brought out a major shift in national germplasm exchange policies, and therefore, it became essential, at the international level, to formulate the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) for conservation and sustainable utilization of PGRFA in harmony with CBD provisions.

Presently 64 crops have been covered in the multilateral system (MS). PGRFA will be exchanged through MS where material transfer agreements (MTA) are likely to take care of IPR issues. It should be considered as an opportunity by member countries to regain mutual exchange of PGRFA and related technologies for ushering in food and nutritional security for the human population. The list of crops may be expanded at the later stage by the Governing Body. The treaty envisages the protection of farmers rights as well, in terms of their traditional knowledge and involvement in management of PGRFA. The ITPGRFA will ultimately benefit the humankind at the global level while signifying the sovereign rights of the nations over their biological resources and taking care of benefit sharing and sustainable use of the resources.

References

Chowdhary B (2002) The new international seed treaty: Promises and prospects for food security. *Curr Sci* **83:** 366–369.

FAO (1996) Global Plan of Action for Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture. Division of Plant Production and Protection. FAO, Rome, Italy.

FAO (2001) www.fao.org/legal/TREATIES/033t-e.htm

Fowler C (2004) Accessing genetic resources – international law establishes multilateral system. *Genet. Res. Crop Evol.* **51:** 609-620.

Nagamine T (2004) Access to and benefit sharing for plant genetic resources for food and agriculture. *Farming Japan.* **38:** 16-23.

ANNEX I

List of Crops Covered under the Multilateral System

FOOD CROPS

Crop	Genus	Observations
Breadfruit	Artocarpus	Breadfruit only.
Asparagus	*Asparagus*	
Oat	*Avena*	
Beet	*Beta*	
Brassica complex	*Brassica et al.*	Genera included are: *Brassica, Armoracia, Barbarea, Camelina, Crambe, Diplotaxis, Eruca, Isatis, Lepidium, Raphanobrassica, Raphanus, Rorippa*, and *Sinapis*. This comprises oilseed and vegetable crops such as cabbage, rapeseed, mustard, cress, rocket, radish, and turnip. The species *Lepidium meyenii* (maca) is excluded.
Pigeon Pea	*Cajanus*	
Chickpea	*Cicer*	
Citrus	*Citrus*	Genera *Poncirus* and *Fortunella* are included as root stock.
Coconut	*Cocos*	
Major aroids	*Colocasia, Xanthosoma*	Major aroids include taro, cocoyam, dasheen and tannia.
Carrot	*Daucus*	
Yams	*Dioscorea*	
Finger Millet	*Eleusine*	
Strawberry	*Fragaria*	
Sunflower	*Helianthus*	
Barley	*Hordeum*	
Sweet Potato	*Ipomoea*	
Grass pea	*Lathyrus*	
Lentil	*Lens*	
Apple	*Malus*	
Cassava	*Manihot*	*Manihot esculenta* only.
Banana / Plantain	*Musa*	Except *Musa textilis*.
Rice	*Oryza*	
Pearl Millet	*Pennisetum*	
Beans	*Phaseolus*	Except *Phaseolus polyanthus*.
Pea	*Pisum*	
Rye	*Secale*	
Potato	*Solanum*	Section tuberosa included, except *Solanum phureja*.
Eggplant	*Solanum*	Section melongena included.
Sorghum	*Sorghum*	
Triticale	*Triticosecale*	
Wheat	*Triticum et al.*	Including *Agropyron, Elymus*, and *Secale*.
Faba Bean / Vetch	*Vicia*	
Cowpea *et al.*	*Vigna*	
Maize	*Zea*	Excluding *Zea perennis, Zea diploperennis*, and *Zea luxurians*.

FORAGES

Genera	Species
Legume Forages	
Astragalus	*chinensis, cicer, arenarius*
Canavalia	*ensiformis*
Coronilla	*varia*
Hedysarum	*coronarium*
Lathyrus	*cicera, ciliolatus, hirsutus, ochrus, odoratus, sativus*
Lespedeza	*cuneata, striata, stipulacea*
Lotus	*corniculatus, subbiflorus, uliginosus*
Lupinus	*albus, angustifolius, luteus*
Medicago	*arborea, falcata, sativa, scutellata, rigidula, truncatula*
Melilotus	*albus, officinalis*
Onobrychis	*viciifolia*
Ornithopus	*sativus*
Prosopis	*affinis, alba, chilensis, nigra, pallida*
Pueraria	*phaseoloides*
Trifolium	*alexandrinum, alpestre, ambiguum, angustifolium, arvense, agrocicerum, hybridum, incarnatum, pratense, repens, resupinatum, rueppellianum, semipilosum, subterraneum, vesiculosum*
Grass Forages	
Andropogon	*gayanus*
Agropyron	*cristatum, desertorum*
Agrostis	*stolonifera, tenuis*
Alopecurus	*pratensis*
Arrhenatherum	*elatius*
Dactylis	*glomerata*
Festuca	*arundinacea, gigantea, heterophylla, ovina, pratensis, rubra*
Lolium	*hybridum, multiflorum, perenne, rigidum, temulentum*
Phalaris	*aquatica, arundinacea*
Phleum	*pratense*
Poa	*alpina, annua, pratensis*
Tripsacum	*laxum*
Other Forages	
Atriplex	*halimus, nummularia*
Salsola	*vermiculata*