International Law of Sustainable Agriculture in the 21st Century

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International Law of Sustainable Agriculture in the 21st Century

Abstract
This paper examines the new PGR Treaty, assessing what it contains that is innovative and what it contains that are repackaged existing arrangements. Therefore, the PGR Treaty is described in the context of the pre-existing arrangements and the political forces that shaped it. The examination commences by providing a historical perspective on the transfer and use of plant genetic resources. It introduces institutional arrangements that predate the Treaty and explains the relationships between them. In this, attention focuses on the International Undertaking on Plant Genetic Resources for Food and Agriculture 1983 (International Undertaking) and the Treaty on Biological Diversity 1992 (CBD), especially their attempts to address the politically central issues of allocation of property and profit. By identifying the strengths and weaknesses of those instruments, the innovations and omissions in the PGR Treaty are highlighted.

Keywords
international law, agriculture, biodiversity, plant genetic resources, treaty

Disciplines
Law

Publication Details
ARTICLES

International Law of Sustainable Agriculture in the 21st Century: The International Treaty on Plant Genetic Resources for Food and Agriculture

GREGORY ROSE*

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I. INTRODUCTION

The International Treaty on Plant Genetic Resources for Food and Agriculture (PGR Treaty) is the first ever binding multilateral agreement on sustainable agriculture. It is a milestone in the fields of international law for the environment and agriculture, auguring a new era. International institutions concerned with agriculture have finally matured into a holistically integrated, multilateral twenty-first century legal understanding. Or so it might seem. Alternatively, the PGR Treaty is a cobbled together of inadequate existing arrangements under a new title.

This paper examines the new PGR Treaty, assessing what is innovative about it and examining how it repackages existing arrangements. The PGR Treaty is described in the context of the pre-existing arrangements and the political forces that shaped it. The examination commences by providing a historical perspective on the transfer and use of plant genetic resources, and then the family of institutional arrangements that predate the Treaty are introduced. This family primarily consists of the International Undertaking on Plant Genetic Resources

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5. The phrase “sustainable agriculture” was adopted in Chapter 14.2 of Agenda 21, where it is stated to be the increase of food production and the enhancement of food security. Conservation and sustainable utilization of PGRFA (plant genetic resources for food and agriculture) for sustainable agriculture of plant genetic resources forms one of twelve program areas in Chapter 14. Agenda 21, the sustainable development action plan for the twenty-first century, was adopted in 1992 at the U.N. Conference on Environment Development. See Agenda 21 on the U.N. Sustainable Development website at http://www.un.org/esa/sustdev/agenda21.htm. Interestingly, the phrase “sustainable agriculture” is not used by the U.N. Organisation for Food and Agriculture, which refers to “conservation agriculture” or “resource-efficient” or “resource-effective” agriculture. It aims to “conserve, improve and make more efficient use of natural resources through integrated management of available soil, water and biological resources combined with external inputs, contributing also to environmental conservation and enhanced and sustained agricultural production.” See FAO, Summary: Conservation Agriculture, at http://www.fao.org/ag/ags/AGSE/agse_e/general/OBJECT.htm (last visited Mar. 1, 2003).
for Food and Agriculture\textsuperscript{6} (International Undertaking) and the Treaty on Biological Diversity\textsuperscript{7} (CBD), and special note is made of their attempts to address the politically central issues of allocation of property and profit flowing from plant genetic resources. The Treaty is, primarily, a combination of the characteristics of those two instruments. Further, by identifying the strengths and weaknesses of those instruments, the innovations and omissions in the PGR Treaty are highlighted and the efforts to harmonise them analysed.

The article next appraises the PGR Treaty's implementation prospects by noting the presence or absence of features usually found in successful treaty regimes and concludes with a description of the challenges ahead if the Treaty is indeed to generate a new era of international law for sustainable agriculture.

II. PLANT GENETIC RESOURCES

What are plant genetic resources for food and agriculture? Plant genetic resources are the reproductive or propagating materials of plants that encode their unique characteristics.\textsuperscript{8} Because the new Treaty addresses plant genetic resources "for food and agriculture," it primarily concerns humanity's uses for them.\textsuperscript{9}

Of course, plants have many uses to humans in addition to food and agriculture. For example, coconut is used for both food and fiber, garlic for both food and medicine, and linseed and sugar for both food and industry. Nor is food production a necessary purpose of agriculture. Crops such as rubber, cotton, timber, ornamental flowers, and medicinal herbs all have principally non-food uses. Thus, "plant genetic resources for food and agriculture" (PGRFA) is not a


\textsuperscript{8} Genes are the fundamental physical and functional units of heredity. The combination of genes of an individual is called a genotype. Not all genes contained in a plant are expressed by it, as expression depends in part on the physical environment. For example, a drought-stricken environment might catalyse expression of drought resistance characteristics. Many different genotypes can occur in a given population of plants, especially in the wild. This heterogeneity is the population's survival strategy. The dominant genotype in a population varies over time with environmental conditions. Thus, wild populations are natural stores of a wide range of largely unseen and potentially useful genes. See J.J. Hardon, B. Vosman & Th. J. L. van Hintum, \textit{Identifying Genetic Resources and Their Origin: The Capabilities and Limitations of Modern Biochemical and Legal Systems}, CGRFA Background Study Paper No. 4, at 8, \textit{available at} http://www.fao.org/ag/cgrfa/docs.htm#bsp (last visited Apr. 1, 2003).

scientific or precise phrase. Rather, it encompasses an unidentified range of activities, making it difficult to define the scope of the new Treaty.

The world's primary stores of PGRFA are located in geographic areas with the highest levels of plant inter- and intra-specific genetic variability. These areas, first identified in the 1920s by the Russian geneticist Vavilov, reveal that the plants that comprise humanity's main food staples have their origins in the tropical and sub-tropical zones of Asia, Africa, and Latin America.

However, the centres identified by Vavilov no longer monopolise PGRFA diversity. Through 12,000 years of human cultivation and exchange, many plant varieties for food and agriculture were, and continue to be, developed and their distribution extended. Farmers have traditionally enriched the global store of crop varieties over millennia of investment. Initially, humans undertook this enrichment at the margins of Vavilov centres or, occasionally, over longer travels. The advent of European tall ships and the resulting colonisation of the New World resulted in major transfers of PGRFA from the Old World to the New and across the imperial colonies to plantations. A wide range of introduced plant varieties may now be found growing unaided in the natural environment (in situ) wherever there is a history of their agricultural production. Indeed, all regions naturally rich in endemic PGRFA now depend on crops from other regions for much of their food production.

In the twentieth century, varied samples of important crop varieties were gathered and concentrated in seed banks (ex situ) to facilitate the conservation, development, and distribution of plant varieties for food and agriculture. Most of

10. For a survey of major crops and their primary centres of origin, see Palacios, supra note 9, at 7 (Fig. 2). This survey can be summarised as follows: Rice (East, South East and South Asia, and West Africa); Wheat (West and Central Africa); Sugar Cane (South East and South Asia and Pacific); Sugar Beet (Mediterranean and Europe); Maize (Central America); Soybean (East Asia); Potato (South America); Cassava (South and Central America); Sorghum (Africa); Coconut (Pacific, South East Asia); Yam (South East and South Asia and Africa); Orange (East Asia); Grape (Mediterranean, West and Central Africa); Apple (Europe and Central Asia); Sesame (South and Central Asia, East Africa); Olive (Mediterranean); Oat (Mediterranean and Europe); Rye (West Asia); Millet (Africa, other than Central) and South and South East Asia); Barley (West and Central Asia, Mediterranean); Sweet potato (South and Central America); Oil palm (West Africa); Rape/Mustard (Mediterranean, Europe, and East Africa); Phaseolus beans (South and Central America); Vicia beans (Central Asia); Groundnut beans (South America); Banana plantain (South East and South Asia and Indian Ocean); Tomato (South America); Cocoa (South America); Sunflower (North America); Date (Mediterranean and West Africa); Grapefruit (South East Asia); Pea (West Asia and East Africa); Onion (Central Asia); Paprika (Caribbean); Pineapple (South America); and Cotton (South and East Africa, Central Asia, and South and Central America).
11. Palacios, supra note 9, at 18; see also Jack Ralph Kloppenburg, Jr., First the Seed: The Political Economy of Plant Biotechnology 177 (1988).
13. For an examination of food production based on crops originating in other regions of diversity, see David Cooper, Jan Engels & Emile Frison, A Multilateral System for Plant Genetic Resources: Imperatives, Achievements and Challenges, Issues in Genetic Resources No. 2 (June 1994). The percentage of regional dependence is as follows: West Central Asia 31%, Indochina 34%, Hindustan 49%, Latin America 56%, China-Japan 62%, Africa 88%, Euro-Siberia 91%, Mediterranean 99%, Australia 100%, North America 100%.
these crop varieties are located outside the germplasm's country of origin, continuing the historic dispersion of plant diversity.

The creation of seed banks has not maintained the diversity of plant genetic resources, however. Almost half of all germplasm stocks in seed banks currently need to be regenerated because many are inadequately stored and are degraded. In addition, in situ genetic variability is eroding where natural plant habitats are disrupted and where traditional agricultural crops or farming methods are displaced by uniform modern cultivars and methods. The combined effect is that plant genetic resources are being lost at an alarming rate, both in their countries of origin and in seed banks. Efforts to halt this loss and to conserve and develop PGRFA form part of the challenge of sustainable agriculture.

III. THE EXTENDED FAMILY OF PGRFA MANAGEMENT ARRANGEMENTS

The PGR Treaty provides a cornerstone in the legal framework for the conservation and distribution of PGRFA and operates within the grand endeavour of sustainable agriculture. To analyse the character and prospects of the Treaty, it is essential to first understand the family of global institutions that it will work in partnership with. These global institutions include the U.N. Food and Agriculture Organisation (FAO) and its Commission on Genetic Resources, which provide fora to develop PGRFA policy at the international level. Within the FAO, the Global System on Plant Genetic Resources aims to integrate PGRFA conservation efforts, mostly through the design and implementation of the Global Plan of Action on PGRFA. This article examines various mechanisms contained in the Global System to gather critical information on the state of the world's PGRFA and to warn of impending genetic losses. It also outlines the network of international seed banks and in situ conservation efforts, including the Code For Germplasm Collecting and Transfer.

A. FORUM: U.N. FOOD AND AGRICULTURE ORGANISATION

Since 1946, the FAO has been the primary organisation responsible for global conservation of plant genetic resources for food and agriculture. As noted in Section II, supra, the phrase "for food and agriculture" is difficult to define. The FAO mandate is broad. For example, forestry and cotton production are included in FAO technical assistance work, even though they are not food production activities.

The FAO first addressed PGRFA in the opening meeting of its Committee on Agriculture in 1946. However, little action was taken in those early days. In 1957, the first specialised international newsletter on crop genetic resources was published, and in 1961, a conference on plant genetics was held. Subsequently,

14. KLOPPENBURG, supra note 11, at 160.
16. FOWLER & MOONEY, supra note 12, at 149.
the first International Technical Conference on Plant Genetic Resources took place in 1967 and a crop ecology unit was created a year later. The Plant Production and Protection Division became active in the area of plant genetic resources conservation soon after. The FAO held the second, third and fourth International Technical Conferences on PGRFA in 1973, 1981, and 1996. While the 1970s saw a great increase in global PGRFA activity, much of it took place through national genebanks and botanic gardens, sidestepping the FAO and the U.N. framework completely. However, by the 1980s, the FAO reclaimed significant responsibility for coordinating international measures to stem the erosion of the world's stock of PGRFA, and the FAO Global System on Plant Genetic Resources was subsequently established.

B. FORUM: COMMISSION ON GENETIC RESOURCES

The biennial peak FAO Conference established the Commission on Plant Genetic Resources in 1983. In November 1995, the FAO Conference expanded the Commission's mandate to cover all genetic resources for food and agriculture, including forest, animal, and fishery genetic resources. Thus, it is now called the Commission on Genetic Resources for Food and Agriculture (CGRFA). CGRFA was instructed to take on the expanded mandate incrementally, commencing with animal genetic resources once it completed outstanding tasks already on its agenda. The revision of the International Undertaking was one such outstanding task.

The CGRFA has 165 member countries, a number that has been fairly static for several years, though it is open to all FAO members and associate members. The CGRFA makes its decisions by consensus, but a "one country, one vote" approach to decision making can be taken when necessary. The CGRFA meets biennially and operates intersessionally through Intergovernmental Technical Working Groups. It spends most of its time serving as a political forum, debating issues of policy for PGRFA activities.

The CGRFA Secretariat, located within the FAO Secretariat, is the expert body that

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18. In fact, the Director-General of the FAO appoints the Secretary to serve the PGR Treaty's Governing Body. See FAO Res. 3.10, supra note 6.
undertakes the collection of preparatory information, research, and the formulation and adoption of documents prior to CGRFA deliberation. The CGRFA Secretariat is responsible for overseeing the Global System for PGRFA.\textsuperscript{25} The CGRFA is to act as the PGR Treaty's Interim Committee until the Treaty enters into force\textsuperscript{26} and thereafter will meet back to back with the Governing Body of the PGR Treaty.\textsuperscript{27}

C. SCHEME: GLOBAL SYSTEM ON PLANT GENETIC RESOURCES

The FAO Global System for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture originally consisted of just a soft law framework (i.e., the International Undertaking that has now evolved into the PGR Treaty) and an inter-governmental forum (the Commission on Plant Genetic Resources). To bring together other disparate international PGRFA management efforts, the Global System has been extended to include: Codes of Conduct and Guidelines; cooperative networks for PGRFA conservation and delivery; an expanding information base on global holdings and erosion of PGRFA; and a global PGRFA management program.\textsuperscript{28} These parts, set out in Table 1 below, are not highly integrated but are gradually becoming more coherent. The Global System is, in effect, a short hand reference to most of the family members related to the PGR Treaty.

<table>
<thead>
<tr>
<th>Information</th>
<th>• Report on State of the World's PGRFA</th>
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<tbody>
<tr>
<td>Global Action</td>
<td>• World Information and Early Warning System</td>
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<tr>
<td>Agreements</td>
<td>• Global Plan of Action</td>
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<td></td>
<td>• International Funds and Financing Mechanisms</td>
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<tr>
<td>Cooperation</td>
<td>• International Undertaking and PGR Treaty</td>
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<td></td>
<td>• Code of Conduct for Germplasm Collecting and Transfer</td>
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<td></td>
<td>• Genebank Standards and Guidelines</td>
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<td>• Code of Conduct on Biotechnology</td>
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<td>• Crop and Thematic Networks</td>
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<td>• Ex Situ Network of Base Collections</td>
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\textsuperscript{25} The CGRFA undertakes the periodic publication of a report on the state of erosion of the world's stock of PGRFA in situ and ex situ; the early warning of major genetic erosion problems; administration of a global plan of action concerning the coordination of conservation of PGRFA; and the holding of the FAO International Technical Conferences on PGRFA. See CGRFA, About the Commission on Genetic Resources, at http://www.fao.org/ag/cgrfa/#secretariat (last visited Apr. 17, 2003).


\textsuperscript{27} PGR Treaty art. 19.9.

D. INFORMATION OVERVIEW: STATE OF THE WORLD'S PGRFA

Effective management of PGRA requires a sound information base. To inform policy formulation, the CGRFA Secretariat compiled the most recent Report on the State of the World's PGRFA for the 1996 FAO International Technical Conference on PGRFA in Leipzig. The Report was designed to expose gaps, constraints, and emergency situations to guide the CGRFA's future discussions and to provide an authoritative base for the Global Plan of Action at that meeting. The Report covered all aspects of conservation and the utilisation of PGRFA and identified programs being carried out by regional, international, and non-governmental organisations.

Signatories to the International Undertaking were required to report annually to the FAO on measures they had taken or proposed to take for the exploration, preservation, evaluation, and availability of PGRFA, but they neglected this responsibility. Although the Report on the State of the World’s PGRFA established a template for such information collection, the PGR Treaty does not impose any reporting obligations on the contracting parties.

E. GLOBAL PLAN OF ACTION ON PGRFA

In 1991, the CGRFA mandated the formulation of a Global Plan of Action on PGRFA. Within the Global System, the Global Plan of Action will be the most directly related to implementation of the PGR Treaty as it puts in place an agenda for PGRFA conservation that meets important objectives of the Treaty.

The Global Plan, as adopted at the 1996 Leipzig Conference, contains twenty chapters, organised into four sections, as set out in Table II below.

The 1996 Conference was designed to develop funded programs to make the Global System fully operational. Financing was controversial, and the Plan was adopted at Leipzig without a resolution of the funding issue. Although the 1996 Conference recognised the need for mobilisation of financial resources and that “full implementation of the Global Plan of Action would involve a significant increase in the activities currently taking place,” no additional funds were forthcoming. The CGRFA Secretariat was requested to refine costing in light of

### Table 2.
**The Global Plan of Action**

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<tr>
<th>In Situ Conservation and Development</th>
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<tbody>
<tr>
<td>1. Surveying and Inventorying of PGRFA</td>
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<td>2. Supporting On-Farm Management and Improvement of PGRFA</td>
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<tr>
<td>3. Assisting Farmers in Disaster Situations to Restore Agricultural Systems</td>
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<td>4. Promoting in situ Conservation of Wild Crop Relatives and Wild Plants for Food Production</td>
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<tr>
<th>Ex Situ Conservation</th>
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<tr>
<td>5. Sustaining Existing Ex Situ Collections</td>
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<td>6. Regenerating Threatened Ex Situ Accessions</td>
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<td>7. Supporting Planned and Targeted Collecting of PGRFA</td>
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<td>8. Expanding Ex Situ Conservation Activities</td>
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<th>Use of Plant Genetic Resources</th>
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<tr>
<td>9. Expanding Characterization, Evaluation and Core Collections</td>
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<tr>
<td>10. Increasing Genetic Enhancement and Base-Broadening</td>
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<tr>
<td>11. Promoting Sustainable Agriculture</td>
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<tr>
<td>12. Promoting Under-utilized Crops and Species</td>
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<td>13. Supporting Seed Production and Distribution</td>
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<tr>
<td>14. Developing New Markets for Local Varieties and Diversity-Rich Products</td>
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<th>Institutions and Capacity Building</th>
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<tr>
<td>15. Building Strong National Programmes</td>
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<td>16. Promoting Networks for PGRFA</td>
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<td>17. Constructing Comprehensive Information System of PGRFA</td>
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<td>18. Developing Monitoring and Early Warning Systems for PGRFA</td>
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<td>19. Expanding and Improving Education and Training</td>
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<td>20. Promoting Public Awareness for PGRFA</td>
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</table>

changes introduced into the Plan at the 1996 Conference. Those changes were aimed at less duplication, better coordination, and better prioritization.\(^{34}\) The Global Plan of Action has since progressed through a series of regional strategy meetings held in 1998, seeking to mobilise and coordinate the resources of international organisations, governments, and non-governmental organisations.\(^{35}\) The CGRFA Secretariat has been revising and representing funding proposals at CGRFA meetings, without success, so existing funds, programs, and institutional resources are still being deployed.\(^{36}\)

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34. In 1998, the European Region proposed a mechanism to better channel the flow of funds from existing available sources. Within the FAO, members caucus within six permanent regional groupings: Africa, Asia, Europe, North America, Latin America and the Caribbean, and Oceania.


36. The proposed funding figures seem to be shrinking. Section 14.G on conservation and sustainable utilization of PGRFA in Agenda 21 (Chapter 14 on Promoting Sustainable Agriculture and Rural Development)
During the CGRFA Fifth Extraordinary Session in 1998, participants suggested alternative funding sources to traditional development assistance. Asian developing countries proposed that a fixed share of financial benefits from the commercialisation of PGRFA be paid into an international fund under the control of the Governing Body of the proposed PGR Treaty. The International Association of Plant Breeders (ASSINSEL) indicated a willingness to study a system where the owners of patents would contribute to such a fund.

Successful implementation of the PGR Treaty is tied to funding for the Global Plan of Action. Article 13.5 of the Treaty provides that full implementation of the Global Plan of Action, particularly in developing and transitioning countries, largely depends upon effective implementation of the Multilateral System of access to PGRFA and its benefit-sharing programs (discussed in Section VI.C, infra), as well as the establishment of the funding strategy under Article 18. Further, the Global Plan of Action embodies PGR Treaty objectives concerning on-farm management, assistance to farmers in disaster situations, and in situ conservation.

Article 14 expressly acknowledges the Global Plan of Action:

Recognizing that the rolling Global Plan of Action for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture is important to this Treaty, Contracting Parties should promote its effective implementation, including through national actions and, as appropriate, international cooperation to provide a coherent framework, inter alia, for capacity-building, technology transfer and exchange of information, taking into account the provisions of Article 13.

However, Article 14 is couched in soft language, such as “should promote.” International cooperation for its implementation is qualified to “as appropriate.” Thus, national action is discretionary.

Neither the Global Plan of Action nor the Treaty can be fully implemented without the other. This idea is acknowledged in the PGR Treaty, but it has been
left to the Governing Body of the PGR Treaty to iron out funding details at its first meeting. It remains unclear how the symbiotic relationship between the Global Plan of Action and the PGR Treaty will develop in practice when the Treaty comes into force.

F. EX SITU: SEED BANK NETWORKS

Conservation of PGRFA can be conceptually divided into in situ and ex situ conservation efforts. Ex situ conservation principally takes place within botanic gardens and seed banks. It is the focus of conservation work within the FAO, as contrasted with the in situ conservation emphasis under the CBD (see Section V, infra).

The principal method for ex situ conservation of agricultural species is through seed banks, which store plants in their dormant form as seeds.\footnote{Botanic gardens are the single most important type of institution involved in ex situ conservation of non-agricultural plants. A decade ago, there were over 1550 botanic gardens in the world, with about 800 or more active in plant conservation. See S. Johnston, Conservation Role of Botanic Gardens and Seed Banks, 2 REV. EUROPEAN COMMUNITY & INT’L ENVTL. L. 174, 179 (1993).} Seed banks range in sophistication from carefully cataloged collections in climate-controlled storage to poorly sorted bags held in humid barns. While many seed banks are public institutions such as dedicated international centres, national centres, and public research institutes, private collections also play a role.\footnote{Id at 175.} Seed bank holdings are dominated by more commercially valuable crops such as wheat (14%). In fact, almost half are such cultivars.\footnote{FAO, Conservation and Use of Plant Genetic Resources, SD DIMENSIONS, at http://www.fao.org/waicent/FAOINFO/SUSTDEV/EPDirect/EPref0041.htm (last visited Mar. 1, 2003).}

The most prominent international seed banks are those in the network of sixteen International Agricultural Research Centres (IARCs) supported by the Consultative Group on International Agricultural Research (CGIAR).\footnote{See the CGIAR website at http://www.cgiar.org/centres.html (last visited Mar. 19, 2003).} Most IARCs have specific local or regional responsibilities for germplasm conservation, with a few collecting specific crops on a worldwide basis.\footnote{IARC work can be broadly divided into six categories: (1) productivity research; (2) management of natural resources; (3) improvement of the policy environment in developing countries; (4) research institution building in developing countries; (5) germplasm conservation; and (6) building of linkages between agricultural research institutions around the world. See GENEFLOW, at http://www.ipgri.cgiar.org/geneflow/geneflow.asp (last visited Mar. 1, 2003).} IARCs hold the world’s largest collection of genetic resources,\footnote{Johnston, supra note 40, at 176.} 500,000 accessions, which is estimated to be 20%-50% of all unique germplasm in storage worldwide.\footnote{FAO, State of the World’s Plant Genetic Resources for Food and Agriculture, at 185 (Rome 1996).} The International Plant Genetics Resource Institute (IPGRI) is an IARC that coordinates the activities of the other IARCs and provides financial assistance for some
non-CGIAR conservation facilities.\textsuperscript{47}

The Washington-based CGIAR is an umbrella organisation that aims to extend the scope, reach, and effectiveness of agricultural research, originally promoting the "green revolution."\textsuperscript{48} Established in 1971 by sponsoring agencies such as the Ford and Rockefeller funds, it is chaired by the World Bank and is structured as an informal association of donors, research centres, and non-donor representatives from developing countries (where much of the research is carried out).\textsuperscript{49}

The combined efforts of the FAO and the IARCs have established a multilateral system for access to PGRFA held in IARC collections. Although not identical with it, the PGR Treaty relies in large part on this system for its own regime governing access to PGRFA. Article 7 of the International Undertaking already required the development of such a system to bring together base collections in seed banks under the auspices of the FAO. At its second session, held in 1985, the CGRFA considered legal arrangements to establish the international network required under Article 7. In 1988, the FAO invited the IARCs of the CGIAR to place their collections under its auspices in an International Network. Twelve IARCs signed agreements with the FAO in 1994 to establish interim arrangements for germplasm collected prior to the entry into force of the CBD.\textsuperscript{50} The agreements were renewed in 1998 together with an additional series of tripartite coconut agreements between the FAO, the IPGRI on behalf of the International Coconut Genetic Resources Network, and those countries hosting the coconut genebanks. At that time, thirty-two countries expressed a willingness to place their national collections in the International Network, but further agreements with them were put on hold while the PGR Treaty was being negotiated.\textsuperscript{51} It

\textsuperscript{47} Id. at 175. See also the IPGRI website at http://www.ipgri.cgiar.org (last visited Mar. 19, 2003).

\textsuperscript{48} KLOPPENBERG, supra note 11, at 160.

\textsuperscript{49} The forty public and private sector donors are a consortium of countries, private foundations, and regional development banks, as well as the World Bank, U.N. Development Program, and FAO. The work of the CGIAR has been subject to criticism from some developing countries and conservationists as tending to wrest control of PGRFA from developing countries and traditional farmers and deliver it to developed countries and commercial agricultural interests. As the CGIAR stands outside of the U.N. system, it can be accused of being answerable to donor countries and their agri-industrial interests as much as to international food and agricultural security concerns. \textit{Id.} at 164; \textit{In Search of Firmer Ground, 6 Rural Advancement Foundation Int’l Occasional Paper Series 2 (Oct. 19, 2000)}, at http://www.etcgroup.org/article.asp?newsid=171. In 1990 and 1991, CGIAR decided to reorient more towards work on sustainable development. In order to maintain the productivity of natural resource bases, it decided to focus on protecting the diversity of PGRFA, dealing with soil degradation, addressing climate change, and promoting growth in less productive areas and management of pests and nutrients in ways that would reduce dependence on agricultural chemicals. This new approach resulted in change and expansion in the system; see \textit{History of the CGIAR} on its website at http://www.cgiar.org/who/wwa_history.html (last visited Apr. 17, 2003).

\textsuperscript{50} International Plant Genetic Resources Institute, \textit{Access to Plant Genetic Resources and the Equitable Sharing of Benefits}, 4:4 GENETIC RESOURCES at i (June 1996) [hereinafter IPGRI MUSE Study].

remains to be seen whether these agreements will still be forthcoming when the PGR Treaty comes into force.

The agreements between the FAO and IARCs under the CGIAR follow a common template adopted to clarify ownership, obligations with respect to conservation and availability of germplasm, and the policy role of the CGRFA. The bilateral agreements provide for designated germplasm held by IARCs to be distributed subject to Material Transfer Agreements (MTAs). Designated germplasm is set out in a list (appended to each MTA) and comprises material: (1) developed by the IARC; (2) acquired prior to the entry into force of the CBD; or (3) acquired after the entry into force of the CBD, but on the understanding that it could be made freely available for agricultural research or breeding purposes.

The terms of the MTAs provide that an IARC holds the germplasm as a trustee for the world community and makes available the germplasm "as part of its policy of maximising the utilisation of genetic material for research." However, availability is subject to conditions intended to ensure that it is used for public benefit. Therefore, recipients are prohibited from establishing legal ownership or intellectual property rights over the "germplasm or related information" and are bound to ensure that any subsequent recipients also do not.

Under the PGR Treaty, the IARCs are called upon to sign new agreements with the new Treaty's Governing Body to make PGRFA available in accordance with the terms of the Treaty. The MTAs are to be revised accordingly. Some of the changes that will be required in the new MTAs are described in Section VI.B below.

G. EX SITU: INFORMATION AND EARLY WARNING SYSTEM

In some instances, the loss of plant genetic diversity is as great in genebanks as it is in the field. This results from the inadequate standards of many ex situ PGRFA holdings. The aim of the FAO World Information and Early Warning System (WIEWS) on PGRFA is to draw rapid attention to specific hazards threatening the extinction of plant species and the operation of genebanks. It links a network of international and national databases and feeds into the broader periodic FAO Report on the State of the World's PGRFA.

55. Id.
56. PGR Treaty art. 15.1.
57. Chapter 14, Program G, On Conservation of PGRFA, in Agenda 21, supra note 5; see also Fowler & Mooney, supra note 12, at 163-65.
The PGR Treaty does not recognise a formal role for the FAO World Information and Warning System. Instead, the Treaty simply calls upon contracting parties to “develop and strengthen a global information system.” This information system is to build on “existing information systems” in cooperation with the CGRFA and the Clearing House Mechanism of the CBD. The language suggests that the FAO Information and Warning System should become part of a more open and connective information network.

H. IN SITU: CODE FOR GERMPLASM COLLECTING AND TRANSFER

In 1993, the FAO Conference adopted an International Code of Conduct for Plant Germplasm Collecting and Transfer. The Code is intended to facilitate bilateral negotiations for access to PGRFA found in situ. It stands alongside and assists the implementation of the CBD access provisions but applies only to PGRFA. The Code is relevant also to implementation of the PGR Treaty, as it aims to regulate the collection and transfer of PGRFA so as to facilitate access and sustainable utilisation, as well as to prevent genetic erosion. However, it adds little to either.

The Code reiterates that nations have sovereign rights over their PGRFA, but also that PGRFA should be made readily available. It recognises the rights of local farming and indigenous communities to the PGRFA they maintain. At the same time, the Code re-emphasises the need to share the benefits derived from PGRFA between the source States and the collectors or users of germplasm. To this end, it suggests ways in which the collectors or users may pass on a share of the benefits to the donors, recognising the rights and needs of local communities and farmers.

Unlike the Multilateral System under the PGR Treaty and the CGIAR-FAO agreements, the Code's provisions concerning access are not legally binding on its adherents. Nevertheless, the Code includes reporting provisions to allow the CGRFA to monitor its implementation. In the case of non-observance by a collector of the principles of the Code or of the rules and regulations of the host country, the host country can report the matter to the CGRFA. Any such offence against the Code would jeopardise an offending State's entitlement to a certificate from the FAO stating that there are no unresolved complaints against them. Nevertheless the Code ultimately lacks force.

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59. PGR Treaty art. 17(1).
60. PGR Treaty art. 17.
63. Code, supra note 61, art. 3.2.
64. Id. art. 15.
Outside the Code of Conduct, regional developments to implement the CBD are consistent with implementation of the Code. These regional developments are discussed in the context of the CBD, which is the driving force in these developments, in Section V.C, infra.

I. IN SITU: CONSERVATION

The FAO, in cooperation with other organisations, is developing a network of in situ conservation areas. This work takes place under the Global Plan of Action and focuses on conserving wild relatives of cultivated plants, the promotion of "on-farm conservation," and the utilisation of "land races." Fowler and Mooney persuasively argue that the conservation of agricultural diversity can best be achieved through the use of many strategies. Reliance exclusively on ex situ conservation in IARC seed banks is seen as a risky strategy because the range of accessions collected is skewed, incomplete, and sub-optimal. Therefore, additional in situ conservation through on-farm use of land races of PGRFA by farmers is essential. Successful examples of on-farm approaches include seed saving through community seed banks in Indonesia, the Seed Savers Exchange in the United States, and community-based education programs for conservation of land races in India and the Philippines.

J. CBD: AGRICULTURAL BIODIVERSITY

Beyond the FAO Global System, but in tandem with the International Technical Conference in Leipzig, the Conference of Parties to the CBD adopted a decision on conservation and sustainable use of agricultural biodiversity in 1996. The CBD decision extends beyond plants to include animal genetic resources and mandates that the CBD work on the conservation of diversity at the interface of agro-ecosystems with other ecosystems, the sustainable use of genetic resources for food and agriculture, and the equitable sharing of benefits. The CBD's emerging work on agricultural biodiversity takes place in close collaboration with the FAO. For example, much information collection for the CBD on current agricultural biodiversity was performed by the FAO, and the CBD welcomed the FAO Global Plan of Action and revision of the International Undertaking.

67. Land races are the preferred crop cultivars gradually developed by traditional farmers through generations of selective planting.
68. Fowler & Mooney, supra note 12, at 218.
69. Id. at 204-18.
In 2000, following a period of information collection, the CBD Fifth Conference of Parties adopted an agricultural biodiversity work program that focuses on general and holistic approaches that complement the work of the FAO and others, such as the IARCs. The CBD program addresses general aspects of agricultural biodiversity under the headings of trend assessments, adaptive management, capacity building, and mainstreaming.\(^\text{72}\) Two cross-sectoral issues are also included in the program: Genetic Use Restriction Technologies (GURTs) and an International Initiative for the Conservation and Sustainable Use of Pollinators.

The foregoing survey outlines the diverse components within the FAO Global System on Plant Genetic Resources that have been designed (or reworked in the case of the CGIAR-IARCs) to complement each other. The PGR Treaty provides a legal framework for them and cannot operate without them. Beyond the FAO system, the agricultural biodiversity program under the CBD is also designed to work with the Global System. Thus, a substantial range of international institutions and cooperative schemes have been set in place for the conservation and utilisation of PGRFA and are co-evolving in patterns of mutual cooperation.

The Global System’s achievements and failures are well established. For example, its network of seed banks for germplasm conservation and development are a success, holding the world’s largest collection of PGRFA. Its initially lethargic Commission is maturing into a negotiating forum for formulation of authoritative policies and treaties, as exhibited by the Global Plan of Action and the PGR Treaty. However, it is doubtful that the Global System’s information coordination and in situ conservation is successful. Finally, its efforts to encourage and reward farmers for the conservation and utilisation of land races seem a clear failure.

Yet, beyond the FAO Global System and the CBD, there are other relevant international legal institutions protecting intellectual property rights on PGRFA. They concern plant breeders’ rights under the Union on Protection of Varieties (UPOV) and plant patents under the World Intellectual Property Organisation (WIPO) together with the World Trade Organisation (WTO).\(^\text{73}\) Although these regimes provide incentives for commercial development of PGRFA, they more directly act as constraints on its utilisation and do not affect the conservation and utilisation of wild species or land races of PGRFA.\(^\text{74}\) Therefore, they are not elaborated on further.


\(^{73}\) They are, however, treated as components of the complex by Susan Braddon and David Downes in Recent Policy Trends and Developments Related to the Conservation Use and Development of Genetic Resources, ISSUES IN GENETIC RESOURCES No. 7 (June 1998).

\(^{74}\) See id. on this point.
IV. INTERNATIONAL UNDERTAKING: MATERNAL PROFILE

The International Undertaking on Plant Genetic Resources was, until the adoption of the PGR Treaty, the legal cornerstone of the FAO Global System. The Treaty emerged from the revision of the Undertaking and, as its heir, inherited many qualities and approaches implicit in the Undertaking. This section examines in detail the strengths and weaknesses of the International Undertaking, providing a basis for considering in Section VI whether the PGR Treaty has maintained these strengths, addressed faults, or filled gaps.

The International Undertaking was adopted, like the decision creating the CPGR, by the FAO Conference in 1983. Although originally proposed as legally binding, it was ultimately reduced to a voluntary instrument and even then adopted only by a ‘north-south’ split vote. It was adhered to by 113 states. States that did not adhere to the International Undertaking itself were still among the 161 members of the CGRFA and were able to participate fully in its deliberations. Thus, the United States, which was a member but not an adherent, played an influential role in the CGRFA’s PGR Treaty negotiations.

The International Undertaking was conceived in a time of free access to and free exchange of PGRFA. Article 1 expressed this fundamental premise:

The Undertaking is based on the universally accepted principle that plant genetic resources are a heritage of mankind and consequently should be available without restriction.

Free access and exchange of PGRFA was premised on the global promotion of agricultural research, improvement of food production, and enhancement of world food security. Governmental research institutions conducted most agricultural research, so work was shared. It was a more naive and innocent world.

The International Undertaking then grew to live in turbulent times of economic rationalism and political turmoil for the exchange of plant genetic resources. Agricultural research became increasingly privatised in the 1980s, particularly in the United States. This trend continued in other developed countries throughout the 1990s as government agricultural research departments were required to produce commercial returns so that much of their research could continue.


76. See CGRFA, supra note 24.

77. Eight developed countries formally recorded their reservations and declined to adhere to the International Undertaking at the time of its adoption: Canada, France, Germany, Japan, New Zealand, Switzerland, the United Kingdom, and the United States. See Bordwin, supra note 75, at 1069; Kerry ten Kate and Carolina Lasén Díaz, The Undertaking Revisited: A Commentary on the Revision on the International Undertaking on Plant Genetic Resources for Food and Agriculture, 6:3 REV. OF EUROPEAN COMMUNITY & INT’L ENVTL. L. 284, 288 n.5 (1997).

78. See CGRFA supra note 24.

79. See generally International Undertaking, supra note 31.
Commerially-driven agricultural research strengthened plant breeders' rights and patents on plant genetic resources.\textsuperscript{80} Internationally, some developing countries that purchased agricultural products found themselves obliged to pay for these products, even though they did not have to before. Adding insult to their injury was the knowledge that some of them had supplied the raw PGRFA material of those products free of charge.\textsuperscript{81} Usually, as the originators of the genetic material, farmers in developing countries had also refined and improved it themselves over generations of breeding, and then handed it over for further research and development without protecting it under any legal system of their own.\textsuperscript{82}

The International Undertaking aimed at ensuring that such PGRFA, especially those species of present or future economic and social importance, were conserved, utilised, and made available for plant breeding and other scientific purposes.\textsuperscript{83}

The vague and non-binding nature of the International Undertaking allowed many of the provisions to be simply ignored or breached. For example, the establishment of an International Network of seed banks under Article 7, as described in Section III.F above, was slow. Similarly, there had been no significant progress under Article 11 in setting up international funds for PGRFA conservation and management outside of existing FAO funds.

The status of the International Undertaking since the adoption of the PGR Treaty is unclear. There has been no resolution on the part of the Commission on Genetic Resources for Food and Agriculture to repeal the Undertaking, nor has there been any negation of it in the body of the PGR Treaty itself. The Undertaking is therefore technically operative, but functionally defunct.\textsuperscript{84}

Unreconciled diverse interests at an international level hampered the implementation of the International Undertaking. These were, on one hand, the interests of

\textsuperscript{80} In an international landmark decision in 1980, the U.S. Supreme Court decided on appeal that a living thing could be patented. Diamond v. Chakrabarty, 447 U.S. 303 (1980). That decision opened the way for successful applications for patents on plants. KLOPPENBURG, supra note 11, at 262-68. In 1991, the UPOV Convention was amended to limit the rights of farmers to reuse seeds on the farm ("farmers' privilege") that were saved from commercially-bred plant varieties. Noel Byrne, \textit{Plant Breeding and the UPOV}, 2 REV. EUROPEAN COMMUNITY & INT'\l ENVTL. L. 2, 136, 138 (1993).

\textsuperscript{81} FOWLER & MOONEY, supra note 12, at 205.


\textsuperscript{83} It contained provisions dealing with the exploration and collection of PGRFA (Article 3), preservation, evaluation and documentation of PGRFA in situ and ex situ (Article 4), access to and availability of PGRFA (Article 5), international cooperation in conservation, exchange and plant breeding (Article 6), international coordination of genebank collections and information systems (Article 7), PGRFA conservation and management activities funding (Article 8), activities monitoring by the FAO (Article 9), and the maintenance of phytosanitary measures for plant protection (i.e., plant quarantine, Article 10). Article 11 required States to provide annual information to the FAO on measures they had taken, or proposed to take, for achieving the objectives of the Undertaking.

\textsuperscript{84} For these reasons, references to the Undertaking in this article are in the past tense.
the (mostly developing) countries, which had a natural abundance of PGRFA and wished to maintain control over them, and, on the other hand, the interests of the (mostly developed) countries which had made capital investments in breeding or engineering PGRFA and wished to maintain control over their refined products. It is ironic that, whilst seeking to restrict foreign access to its own holdings, each also desired unhindered free access to the others' holdings of PGRFA.

This tension was reflected in the revision of the International Undertaking. Ultimately, the main issue was who would get what and for how much. This dilemma is analysed here as a series of issues: What is the scope of PGRFA covered? Is access facilitated to those PGRFA? Is a commercial benefit to be shared? Should special arrangements be made for those originators of PGRFA who are traditional agricultural cultivators (called "Farmers' Rights")?

A. INTERNATIONAL UNDERTAKING – SCOPE

In Article 2 of the International Undertaking, plant genetic resources were defined as the reproductive or vegetative propagating material of five categories of plants.85

These five categories ranged from naturally occurring varieties ("wild" and "weed" species), through those that have been modified by traditional breeding practices at the village level ("primitive" and "obsolete" cultivars), to modern cultivars, including even the refined species held by professional breeders like seed companies ("special genetic stocks"). This broad scope alarmed some developed country FAO members, as the free access principle appeared to include the commercially valuable PGRFA produced by their agricultural research enterprises.86

Although the five categories of PGRFA listed were only within the scope of the International Undertaking if used for food and agriculture, it should be noted that it is impossible ab initio to identify a particular PGRFA on the basis of what it can later be used for. Therefore, all PGRFA might be initially included within the scope of the International Undertaking, pending an exclusion by agreement of the CGRFA. This ambiguity remains within the PGR Treaty.

B. INTERNATIONAL UNDERTAKING – ACCESS

The Undertaking was originally based on the “universally accepted” principle

85. These five categories include:
   i. Cultivated varieties (cultivars) in current use and newly developed varieties;
   ii. Obsolete cultivars;
   iii. Primitive cultivars (land races);
   iv. Wild and weed species, near relatives of cultivated varieties; and
   v. Special genetic stocks (including elite and current breeders' lines and mutants).

86. Bordwin, supra note 75, at 1064.
that PGRFA are part of the shared (but not common) "heritage of mankind" and “should be available without restriction.” While “heritage of mankind” was not defined, the Undertaking made it clear that this meant that the world’s PGRFA should be “freely available” to all (although not necessarily free of charge). Article 5 on “Availability of Plant Genetic Resources” stated:

It will be the policy of adhering Governments and institutions having PGRFA under their control to allow access to samples of such resources, and to permit their export, where the resources have been requested for the purposes of scientific research, plant breeding or genetic resource conservation. The samples will be made available free of charge, on the basis of mutual exchange or on mutually agreed terms.88

This produced a need to rebalance interests between exclusive property rights for modern commercial products and general access to traditional farmers’ and wild varieties. As a result, three resolutions, which qualified the principle of PGRFA being common heritage, were adopted unanimously at the FAO Conferences of 1989 and 1991 and added to the Undertaking as Annexes.89 The resolutions asserted the sovereign rights of countries over their PGRFA, clarified that free access did not necessarily mean free of charge, limited the benefit of free access to those adhering to the Undertaking, and limited the scope of free access to exclude breeders’ lines and farmers’ breeding material.

These qualifications recognized that there are differences between developed and developing countries, which play out in their laws on PGRFA. There are substantial legal systems for protection of new plant breeds and biotechnologically engineered PGRFA in developed countries but no legal systems in developing countries for their traditional farmers’ varieties and wild varieties. Only sovereign rights provide a tool for such legal protection by developing countries. Consequently, several more States adhered to the International Undertaking.90 However, some important countries still withheld their adherence, including the United States, Japan, and Canada, as well as Brazil, China, and Malaysia.91 These same countries maintained their positions and were resistant to the introduction of unrestricted access in negotiations for the PGR Treaty.

C. INTERNATIONAL UNDERTAKING – BENEFIT-SHARING

Although Annex 1 to the International Undertaking recognised that free access

88. International Undertaking, supra note 31, art. 5.
90. For example, Australia adhered after adoption of the 1989 and 1991 amendments.
91. See CGRFA, supra note 24.
did not necessarily mean free of charge, it did not elaborate on what that meant. For example, a charge might be a small administrative fee or it might be a complex formula for sharing bilaterally the benefits of commercial development of the PGRFA. Ultimately, the International Undertaking did not explicitly recognise or endorse the notion of genetic resource benefit-sharing.

There were practical reasons for this. One is that modern crop varieties tend to have complex pedigrees and many ancestors. For example, the rice variety, IR36, was the result of twenty years of breeding and has in its heritage fifteen land races and one wild species. When a plant product contains material from sixteen different sources, how is the component value of one of those genetic inputs to be assessed as part of ten years of research and development? In addition, the development and distribution of new breeds was perceived as a widely shared benefit. Crop varieties contain their own reproductive material and eighty percent of the seed required for planting in developing countries is saved by farmers or exchanged by them, rather than purchased commercially. Thus, the global market for commercial crop seed is relatively small, and the transaction costs of benefit-sharing may outweigh its implementation in the real world of agricultural research and development.

**D. INTERNATIONAL UNDERTAKING – FARMERS’ RIGHTS**

Under the International Undertaking, Farmers’ Rights are a collectively held benefit allocated to traditional farmers mostly in developing countries in reward for their past work in the conservation and development of PGRFA. Farmers’ Rights were set out in the Annexes to the International Undertaking. Resolution 4/89 recognised the “enormous contribution that farmers of all regions have made to the conservation and development of plant genetic resources.” Resolution 5/89 defined their rights as “arising from the past, present and future contributions of farmers in conserving, improving and making available plant genetic resources, particularly those in the centres of origin/diversity.”

In keeping with this communitarian tone, the International Undertaking expressed Farmers’ Rights as a common benefit of farmers and farming communities in all areas of the world. Farmers’ Rights were to benefit them by ensuring the protection and conservation of PGRFA and by ensuring that farmers could

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92. Annex I (Resolution 4/89), Part 5; see also supra note 89.
93. See IPGRI MUSE Study, supra note 50, at 20.
94. Article 15 of the UPOV Convention permits the “farmers’ privilege” to replant seeds saved from breeders’ lines when national legislation so provides. However, some genetically engineered plants can undermine the privilege if they are designed with “terminator technologies” that produce sterile seeds.
95. These are estimated at U.S. $15 billion in 1990, of which U.S. $1.75 billion accounted for horticultural seed. IPGRI MUSE Study, supra note 50, at 25 (citing The World Seed Market: Development and Strategy (a study by Rabobank Nederland Agribusiness Research, Utrecht, The Netherlands 1994)).
96. On Farmers’ Rights, see Annex I (Resolution 4/89), Parts 3 & 4; Annex II (Resolution 5/89) in its entirety; and Annex III (Resolution 3/91), Part 3.
fully participate in the improved use of PGRFA through plant breeding and other scientific methods. Responsibility for administration of this common benefit was “vested in the International Community, as trustee for present and future generations of farmers” and was to be implemented by it, in particular, through an International Fund for PGRFA monitored by the CGRFA. Resolution 3/91 provided that the International Fund resources should be substantial, sustainable, and based on principles of equity and transparency. The emphasis of the work of the International Fund was to be on the development of capacities in the conservation and management of PGRFA in developing countries.

Thus, Farmers’ Rights under the International Undertaking are quite different from contemporary real, personal, or intellectual property rights in that they do not allocate rights directly to individuals. It would be impossible to identify the individual farmers of all regions who hold the rights in question. Therefore, the “International Community” was designated as trustee of those rights for “past and future generations of farmers.” Further, because there was no according of rights to the State, Farmers’ Rights are not considered to be sovereign rights.

Superficially, farmers were the beneficiaries of Farmers’ Rights. However, they were to benefit merely by ensured participation in the improved conservation and utilisation of PGRFA. The inconsistencies in the notion heated negotiations of the PGR Treaty until the text for Farmers’ Rights finally fizzled into empty rhetoric. In summary, the scope of the International Undertaking was wide, although indeterminate, covering all plant genetic resources used for food and agriculture. It promoted unrestricted access to all PGRFA, but the notion of benefit-sharing was not satisfactorily developed. The concept of Farmers’ Rights emerged but was not given substance. The International Undertaking was never made legally binding and was soon overtaken by a new treaty, the Convention on Biological Diversity.

V. CONVENTION ON BIODIVERSITY: PATERNAL PROFILE

The rights of countries of origin to restrict the access of others to their native

98. Id.
99. Id.
100. At the Fifth Session of the CPGR (April 1993), it was agreed that questions remaining to be answered in relation to the International Fund include: the nature of funding (voluntary or mandatory); linkage between financial responsibility and benefit from the use of PGRFA; whether countries, users or consumers should bear financial responsibilities; how the relative needs of beneficiaries (especially developing countries) are to be estimated; and how farmers and local communities would benefit from the funding. CL 103/16, Report of the 5th Session of the Commission on Plant Genetic Resources (FAO, Rome 1993). Since then these financial questions have also been addressed in the context of revision of the International Undertaking and the funding of the Global Plan of Action, but with little progress.
101. Nevertheless, as indicated by the nature of their interventions in the CPGR, some countries (e.g., Malaysia) do not distinguish between Farmers’ Rights and the national interest in obtaining benefits by representing farmers (observation of the author at the Sixth CPGR Ordinary Session, June 1995).
PGRFA were formally recognised as international law in response to the privatisation of genetic resources, only ten years after the free access regime of the International Undertaking was articulated. These rights were articulated in the form of State sovereign rights as set out in the CBD.\textsuperscript{102}

The CBD clearly articulates positions on some matters that were also addressed by the International Undertaking.\textsuperscript{103} However, the CBD is a legally binding treaty with 179 parties,\textsuperscript{104} whereas the International Undertaking was a non-binding political commitment with the status of a U.N. agency conference resolution.\textsuperscript{105} Accordingly, between adherents to both instruments, the CBD superseded the International Undertaking in relation to matters they both covered. In relation to other matters, the political persuasiveness of the International Undertaking was uncertain but surely diminished.

The purpose of this section of the discussion is to identify the characteristics of the CBD that depart from the International Undertaking so as to be able to examine how they were taken up in the PGR Treaty.

A. CBD – SCOPE

Article 15.3 of the CBD sets out its scope concerning access to genetic resources. It states:

For the purposes of this Treaty, the genetic resources being provided by a Contracting Party . . . are only those that are provided by Contracting Parties that are countries of origin of such resources or by the Parties that acquired the genetic resources in accordance with the Treaty.

This provision applies as from the date of entry into force of the CBD, 29 December 1993, and not before.\textsuperscript{106} It covers the removal of genetic resources\textsuperscript{107}

\textsuperscript{102} Article 15.1 provides that:

Recognising the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation.

\textsuperscript{103} See supra Section IV.

\textsuperscript{104} Parties to the Convention on Biological Diversity on the CBD website, at http://www.biodiv.org/world/parties.asp (last visited Apr. 7, 2003). Therefore the vast majority of U.N. members are Parties to the CBD.

\textsuperscript{105} See supra Section IV.


\textsuperscript{107} It is interesting to note that the CBD provisions on conservation and sustainable use apply to a broader subject range of biological resources than the provisions on access. The provisions on access apply merely to genetic resources, whereas the other provisions cover all biological resources, including genetic, animal, microbiological, and biochemical resources. Exclusion of biochemical resources from the CBD access provisions raises questions about the applicability of the CBD to bioprospecting for active biochemical ingredients. See the discussion of this by the CBD Secretariat in 3rd Conference of Parties for the Convention on Biological Diversity, UNEP/CBD/COP/2/13 (1996). However, as biochemicals are drawn from living materials that are genetic resources, they are indirectly covered. National legislation may treat biochemicals as genetic resources. Conference of the Parties to the Convention on Biological Diversity, 3rd Meeting, Buenos
from countries of origin subsequent to that date, but does not cover acquisition from countries that are not countries of origin, nor countries that are not, or at the time of removal were not, CBD Parties. Most PGRFA held outside the country of origin, such as seeds in established seed banks and plants in botanical gardens, was acquired prior to the CBD coming into force for the country holding the ex situ collection. The International Undertaking dealt with access to PGRFA that included pre-existing ex situ collections in seed banks and botanical gardens, irrespective of the coming into force of the CBD. Similarly, the PGR Treaty fills the CBD temporal gap.

Other than temporally, the coverage of subject matter under the CBD is broader than the International Undertaking or the PGR Treaty. They apply solely to plant genetic resources, whereas the CBD provisions on access apply to all genetic resources.

B. CBD – ACCESS

The CBD is geared towards bilateral access agreements. It refers to “each Contracting Party” reaching “mutually agreed terms” based on “prior informed consent.” Accordingly, the Secretariat of the CBD has recorded the national access regimes put in place by each CBD Party to inform all other parties of the process being used for negotiating bilateral access arrangements.

In contrast, the International Undertaking mandated the creation of an International Network of coordinated seed bank collections that was to facilitate uniform multilateral access to PGRFA. Although the International Undertaking provided for access on mutually agreed terms, it emphasised multilateral solutions and international institutional mechanisms. The PGR Treaty has a similar focus, as can be seen in its access provisions set out under Section VI.B below.

C. CBD – BENEFIT-SHARING

Article 15 of the CBD requires the “sharing in a fair and equitable way [of] the results of research and development and the benefits arising from the commercial

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109. However, as noted in Section VI, the scope of the PGR Treaty has been limited by Article 11, which stipulates that the Multilateral System for facilitating access to PGRFA only applies to those species listed Annex I.

110. Interestingly, the CBD Conference of Parties has decided that the CBD does not cover human genetic resources (Decision II/11). This decision is based on practical and ethical considerations, as the Treaty makes no distinction between species categories of genetic resources, which are defined simply as “genetic material of actual or potential value.” CBD art. 2.

111. CBD art. 15.2.

112. CBD art. 15.4.

113. CBD art. 15.5.
and other utilisation of genetic resources.” 114 This fundamental position 115 is supplemented by requirements to give developing countries “priority access on a fair and equitable basis” to biotechnologies “based upon” their genetic resources 116 and also to transfer technology to them for the conservation and sustainable use of biological diversity on “fair and most favourable” terms. 117 However, the CBD, unlike the International Undertaking, makes no requirement that benefits flowing from the development of PGRFA be directed towards genetic resources conservation. For example, the country of origin can channel profits shared with it into road building.

Work within the CBD framework to elaborate and clarify Article 15 commenced with the Secretariat’s compilation of documentation on equitable benefit-sharing in State and regional practice that were considered at the second and third CBD Conferences of Parties in 1995 and 1996. 118 For example, the Manila Declaration Concerning the Ethical Utilisation of Asian Biological Resources 119 recommends the development of adequate national legislation to exercise control over the collection and export of biological material by Asian countries. It includes a Code of Ethics for Foreign Collectors of Biological Samples that recommends a set of actions by foreign collectors to ensure that developing country signatories providing biological samples are not disadvantaged. 120 Accordingly, the Philippines required that the grant of a permit to collect biological resources was conditional on the conferral to the Philippines of rights to share information and technology. In the case of commercial application, a license was required to manufacture any patented product derived from the genetic resources

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114. CBD art. 15.7.
115. Fair and equitable sharing of benefits is a fundamental objective of the CBD as set out in Article 1. Desire to share the profits flowing from pharmaceuticals, rather than seeds, was a driving consideration in the negotiation of Article 15 of the CBD. The global pharmaceuticals market is a substantial U.S. $235 billion per annum. A pharmaceutical product may be based on only a single active biochemical compound. It will usually be reproduced through industrial chemical manufacture. Thus, in contrast to multiple plant varieties’ contributions to a commercial seed product, the contribution by a biochemical to a pharmaceutical’s value is calculable and holds substantial profit. See IPGRI MUSE Study, supra note 50.
116. CBD Article 19.2 provides that:

Each Contracting party shall take all practicable measures to promote and advance priority access on a fair and equitable basis by Contracting Parties, especially developing countries, to the result and benefits arising from biotechnologies based upon genetic resources provided by those Contracting Parties. Such access shall be on mutually agreed terms.
117. CBD art. 16.2, at 829. Exchange of information (Article 17) and scientific and technical cooperation (Article 18) are also relevant.
119. Declared at the Seventh Asian Symposium on Medicinal Plants Species and Other Products (ASOMPS VI), held in Manila and attended by 283 scientists from 31 countries (Feb. 2-7, 1992).
120. Appendix 2 is a set of Contract Guidelines designed to promote minimum standards to achieve equity in partnerships transferring genetic resources between developed countries and the country of origin.
collected.\textsuperscript{121} Similarly, five Latin American States have signed an Andean Pact Resolution to regulate foreign access to their genetic resources.\textsuperscript{122} African nations had imposed a ban on access to in situ biological resources, including PGRFA, by collectors when proper informed consent had not been granted.\textsuperscript{123} More broadly, the Declaration of Cancun created a “Group of Like-Minded Megadiverse Countries” to promote the preservation and sustainable use of biological diversity, including equitable sharing of benefits by means of a regime that promoted informed consent and mutuality in transfer agreements.\textsuperscript{124}

Exploring bilateral benefit-sharing within a multilateral system, the International Plant Genetic Resources Institute concluded in 1996 that a strictly bilateral approach to the exchange of PGRFA would be excessively cumbersome, but that bilateral transactions could be facilitated within a broader framework that also facilitates multilateral access.\textsuperscript{125} The broader framework, a Multilateral System for Exchange (MUSE), could set rules for bilateral benefit-sharing triggered by commercialisation in the form of patenting.\textsuperscript{126} However, it also foresaw many difficulties in evaluating the benefits to be shared.

Drawing on these experiences and studies, a CBD Panel of Experts on Access and Benefit-sharing met in 1999 and 2001. Its mandate was to advise on the development of a common understanding of basic concepts and to explore options for access and benefit-sharing on mutually agreed terms.\textsuperscript{127} Its first report concluded that flexibility should be allowed to Parties in negotiating shared benefits, and it distinguished between monetary and non-monetary benefits.\textsuperscript{128} Its

\begin{footnotesize}
\begin{itemize}
\item 121. Executive Order 247, section 5(1), Malacanang, Manila 1995, cited in Bragdon & Downes, supra note 73, at 8; IPGRI MUSE Study, supra note 50, at 22.
\item 124. Declaration of Cancun, Feb. 18, 2002, para. 1(h). Specifically, the regime entails “certification of the legal provenance of biological materials, prior informed consent, and mutually agreed terms for the transfer of genetic material, as requirements for the application and granting of patents, strictly in accordance with the conditions of access agreed by the countries of origin.” The Parties to the Declaration consist of Brazil, China, Colombia, Costa Rica, Ecuador, India, Indonesia, Kenya, Mexico, Peru, South Africa, and Venezuela. Mexican Department of Environment and Natural Resources web site, at http://www.semarnat.gob.mx/internacionales/reunion/doc/CANCUN-DECLARATION.doc (last visited Aug. 3, 2003).
\item 125. Id. Annex IV, para. 11.
\item 126. Id. Annex IV, para. 11.
\end{itemize}
\end{footnotesize}
second report focused more constructively on experience in involvement of stakeholders in access and benefit-sharing.\textsuperscript{129} The Panel’s conclusions were fed into the Ad Hoc Open-ended Working Group of CBD Parties to consider benefit-sharing mechanisms.\textsuperscript{130} The Ad Hoc Group then recommended the Bonn Guidelines that were subsequently adopted by the sixth Conference of Parties in 2002.\textsuperscript{131}

The Bonn Guidelines are voluntary. In relation to benefit-sharing, they merely list monetary and non-monetary options.\textsuperscript{132} They are silent on sharing the benefits flowing from intellectual property rights over genetic resources. Consequently, the Conference of Parties has requested the Secretariat to undertake further information gathering on this matter.\textsuperscript{133} The Working Group will reconvene to report in 2003, primarily on matters to support compliance and capacity building.\textsuperscript{134}

The Bonn Guidelines are comparable in intent to the FAO International Code of Conduct for Plant Germplasm Collecting and Transfer, discussed above in Section III.H. Although the Guidelines extend beyond PGRFA and are more detailed than the Code, each promotes suggestions for bilateral benefit-sharing as a precondition for access and each leaves implementation to the discretion of the countries concerned.

It should be borne in mind that particular PGRFA are commonly found in more than one State’s collection or territory. Multiple holders of a single PGRFA could be inequitably played off, one against the other, in negotiating benefit-sharing arrangements. It would be fairer, in circumstances of commercial development of PGRFA, if benefits for access were multilaterally distributed in a non-arbitrary, equitable way across a group of conserving institutions and countries of origin. Given that a multilateral system could also provide more efficient access than ad hoc bilateral negotiations, it seems that congruent objectives of equity, efficiency, and conservation could be served. Therefore, the bilateral benefit-sharing approach implied in the CBD may be inherently unsatisfactory.

The Bonn Guidelines are expressed to be without prejudice to the PGR Treaty.\textsuperscript{135} In the Treaty, a common trust fund financed by a share of some


\textsuperscript{132} Id.

\textsuperscript{133} Id.

\textsuperscript{134} Id.

\textsuperscript{135} Id. para.10.
commercialised PGRFA remains at the proposal stage, awaiting future negotiation by its Governing Body.\textsuperscript{136} It holds open the possibility of a better alternative to the bilateral approach under the Bonn Guidelines, the proceeds of which could be used to facilitate PGRFA conservation.

D. CBD – TRADITIONAL COMMUNITIES

The CBD makes no reference to Farmers' Rights as articulated in the International Undertaking. However, it does introduce the notion of equitable sharing of benefits arising from utilisation of the technology of indigenous or local communities. Article 8(j) provides:

Each Contracting Party shall, as far as possible and appropriate: Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous or local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices.

This provision honours the role of traditional agriculturists in the conservation of biological diversity, similar to those provisions concerning Farmers’ Rights and PGRFA in the International Undertaking Annexes and in Article 9 of the PGR Treaty. The CBD provision then goes further, however, by recognising the importance of traditional knowledge, innovation, and practices for other uses, implying pharmaceutical and industrial uses.

The CBD leaves the meaning and application of this provision to the broad discretion of each contracting party. Unlike the International Undertaking, the CBD promotes individual approaches to the recognition of traditional agriculturists. Each contracting party is to seek this objective in vague terms, being obliged merely to respect, preserve, maintain, promote, and encourage. Even these obligations are qualified by phrases such as “as far as possible and appropriate” and “subject to its national legislation.”\textsuperscript{137} Thus, while the CBD emphasises the equitable sharing of benefits arising from the utilisation of traditional technologies, it offers no substantially binding provisions for the recognition of traditional agriculturists’ contribution to the pool of PGRFA. Nor is it clear whether traditional communities or the State are to be entitled to the equitably shared benefits. The CBD negotiators opted merely for a flexible general principle.

\textsuperscript{136} See infra Section VI.C.

\textsuperscript{137} The latter is an unusual qualification, as it is a principle of customary international law that domestic legislation offers no defense to the non-implementation of an international obligation. See Alabama Claims Arbitration (U.S. v U.K.) \textit{1 Int. Arb.} (Moore) 495, 656 (1872), quoted in D.J. HARRIS, CASES AND MATERIALS ON INTERNATIONAL LAW 71 (Sweet & Maxwell, 5th ed. 1998). Thus, the requirement is in no way obligatory.
In 1996, CBD parties decided to elaborate guidance for the exercise of national discretion in implementing Article 8(j)\textsuperscript{138} and in 1997 held a Workshop on Traditional Knowledge and Biodiversity that recommended a work plan.\textsuperscript{139} An ad hoc intersessional working group then met in 2000 to refine the work plan\textsuperscript{140} and is continuing to prepare national guidelines on legislation or other mechanisms for, inter alia, equitable sharing of benefits and prior informed consent for traditional communities.\textsuperscript{141}

In contrast, the International Undertaking adopted a multilateral mechanism in the form of a fund.\textsuperscript{142} Further, that fund was not designed primarily to reward traditional knowledge, innovation, and practices leading to utilised benefits. Rather, it was meant to build capacity for improved PGRFA management and conservation. However, implementation of the two instruments has been confused and slow. The PGR Treaty does little to rescue this situation and perhaps worsens it.

In conclusion, the scope of the genetic resources covered by the CBD is wide, even broader than the International Undertaking, although it does not cover genetic resources collected prior to the Convention’s entry into force, leaving a lacuna in ownership arrangements. Concerning access to genetic resources, the CBD requires mutual agreement with the country of origin but sets no international standards for such agreement. Bilateral sharing of the benefits from access is presumed and information on State practice in benefit-sharing is simply exchanged through the CBD Secretariat. In contrast, the International Undertaking, in amending the Annexes, promoted free access in a qualified manner and, instead of benefit-sharing, instituted a collective conservation fund. Traditional communities are considered in benefit-sharing arrangements under the CBD, although there is no requirement to actually distribute benefits to them. It provides guidance to its Parties but leaves any action to their discretion. Similarly instituted under the International Undertaking were equally illusory Farmers’ Rights, supposedly served by the unsuccessful conservation fund.

The CBD and International Undertaking set in place many complementary

\textsuperscript{138} Implementation of Article 8(j), CBD Decision III/14.

\textsuperscript{139} The recommendations are available on the CBD website at http://www.biodiv.org (reference UNEP/CBD/COP/4/10/Add.1).


\textsuperscript{142} See supra note 99 and accompanying text.
principles and mechanisms for the management of PGRFA. These include PGRFA information systems, conservation plans and programs, definitions of PGRFA ownership rights, and efficient access to international genebanks. On the other hand, the problems that remained to be addressed in the wake of the adoption of the CBD include: filling the lacuna in CBD coverage of PGRFA ownership; ensuring future international access to national PGRFA through efficient bilateral or multilateral arrangements; instructive guidelines for low transaction cost benefit-sharing; and resolution of questions over the actual content, if any, of Farmers’ Rights and traditional communities’ entitlements. These outstanding issues made up a mixed inheritance for the PGR Treaty.

VI. THE PGR TREATY: A ROBUST HYBRID?

In May of 1992, at the Conference for the Adoption of the Agreed Text of the CBD in Nairobi, countries adopted Resolution 3 of the “Nairobi Final Act.”\textsuperscript{143} This Resolution concerned the interrelationship between the CBD and sustainable agriculture and requested that the interrelationship be addressed within the context of the FAO Global System for Plant Genetic Resources. It also requested that FAO cooperation be sought.\textsuperscript{144} This would address the lacuna in the CBD concerning PGRFA collections acquired prior to the coming into force of that instrument. In November of 1993, the FAO adopted a resolution that acknowledged the necessity of revising the International Undertaking.\textsuperscript{145} In particular, it recognised the need to harmonise the International Undertaking with the CBD, to facilitate access to PGRFA which remained outside the scope of the CBD, and to address the controversial issue of Farmers’ Rights.

In 1994, the FAO initiated negotiations for the revision of the International Undertaking with the inclusion of the three Annexes added to the International Undertaking in 1989 and 1991 into the body of the PGR Treaty. This technical exercise, referred to by the CPGR Secretariat as Stage I of the revision process, was simple and successful because it did not address the substance of the Annexes.\textsuperscript{146} Further progress in the harmonisation of the substance was slow due to several factors: the technical complexity of the issues; emotive political postures of some developing countries (e.g., Malaysia) concerning predatory bioprospecting; and the obstinate determination of some major agriculturally reliant developed countries (e.g., Canada) to hold on to the status quo. Many


States used their local representatives to the FAO, often with inadequate instructions from their national capitals, to negotiate this complex, political instrument.147

Nevertheless, the Conference of Parties to the CBD repeatedly reaffirmed its request to the FAO to continue work on the matter.148 In 1999, the FAO decided that the negotiations would proceed on the basis that they conclude with a legally binding instrument.149 Revision negotiations took place through sixteen meetings.150

By 2001, the PGR Treaty was the product of seven years of stormy deliberations. It was adopted by the thirty-first session of the Conference of the FAO on November 3, 2001. There were 116 favourable votes, no votes against, and 2 abstentions (the United States and Japan).151 It will enter into force when ratified by forty States.152 The text sets out the Treaty’s objectives and its relationship with the CBD:

1.1 The objectives of this Treaty are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use, in harmony with the Convention on Biological Diversity, for sustainable agriculture and food security.153

The Treaty also provides that these objectives are to be achieved by “closely

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147. Observation of the author at the Sixth CPGR Ordinary Session, June 1995. A cynic might conclude that the slow progress over the first five years of negotiations reflected not only political and technical complexity, but also weak interest on the part of negotiators.

148. Reaffirmation takes place regularly at CBD Conferences of the Parties (e.g., the Fifth conference held in 2000). See Agricultural Biological Diversity: Review of the Phase I of the Programme of Work and Adoption of a Multi-year Work Programme, Meetings of the Conference of the Parties, U.N. Decision V/5 CBD (2000).


153. PGR Treaty art. 1.
linking this Treaty” to the FAO and the CBD\textsuperscript{154} and by the Governing Body establishing and maintaining a close working relationship with the Conference of the Parties to the CBD.\textsuperscript{155} The following sections examine how the PGR Treaty incorporates various elements of the International Undertaking and the CBD in relation to scope, access, benefit-sharing, and the entitlements of traditional farmers, and how it addresses the outstanding problems that those two instruments failed to resolve.

A. PGR TREATY – SCOPE

From the start, definitional questions bogged down negotiations on the scope of the PGR Treaty. For example, should the scope exclude PGRFA collected prior to the coming into force of the CBD or PGRFA cultivated for pharmaceutical, forestry, or industrial purposes? Or should scope be confined to a list of PGRFA for foods? The 1997 Seventh Session of the CGRFA adopted a negotiating text on scope, the essence of which remains unchanged in the PGR Treaty. Article 3 simply provides that “[t]his Treaty relates to plant genetic resources for food and agriculture.” It was thought that this anodyne formulation would leave open for later refinement the difficult questions of whether some specific classes of PGRFA were to be excluded from the scope of the PGR Treaty.

“Plant genetic resources for food and agriculture” are defined as “any genetic material of plant origin of actual or potential value for food and agriculture.”\textsuperscript{156} The term “genetic material” means “any material of plant origin, including reproductive and vegetative propagating material, containing functional units of heredity.”\textsuperscript{157} While nominally limited to uses for “food” and “agriculture,” the socio-economic purposes can be interpreted in an open-ended way.\textsuperscript{158}

At the 1995 CPGR Sixth Regular Session, the United States proposed that the scope of the Treaty be limited to an agreed list of food crops.\textsuperscript{159} The notion of limiting the scope of the PGR Treaty to only those major food crops agreed to by the CGRFA gained significant acceptance for certain purposes from that point on. At the 1997 Seventh Session, the CGRFA refined that proposal by adopting it specifically in relation to the multilateral access provisions of the PGR Treaty. The lacuna in CBD coverage of bioresources was partially filled, at least in relation to listed crops for the purposes of food and agriculture. Although this coverage is narrower than that of the International Undertaking, further PGRFA would still be covered by other PGR Treaty provisions, such as those concerning

\textsuperscript{154} Id. art. 1.2.
\textsuperscript{155} Id. art. 19.3(f), (g), and (l).
\textsuperscript{156} Id. art. 2.
\textsuperscript{157} Id. See supra Section II.
conservation. Thus, the scope of the PGRFA covered varies with the functions of the Treaty provisions.

B. PGR TREATY – ACCESS

The provisions on access are complex and sophisticated. This area is where the PGR Treaty made the most progress in consolidating and elaborating international practice. It also refined some questions that are still unresolved. These questions will form much of the ongoing work of the Treaty’s Governing Body.

A majority of delegations to the 1997 Seventh Session agreed on the need for a multilateral access regime. Article 12.4 of the PGR Treaty now provides that facilitated access will be provided through MTAs, the terms of which the Governing Body shall adopt at its first meeting. Previously, major countries of origin of PGRFA, such as Brazil, had been holding out for bilateral terms of access to be negotiated on an ad hoc basis, presumably anticipating that they could achieve more favourable commercial terms. A multilateral system, however, could have the advantages of facilitating efficient exchange of PGRFA, reducing transaction times and costs and providing an acceptable basis for specific and transparent negotiation of benefit-sharing.

It was agreed that the scope of a facilitated multilateral access system (called the “Multilateral System”) would initially be limited to an agreed list of crops and forages.\textsuperscript{160} The list would form Annex I to the PGR Treaty and, to expand multilateral facilitation of access, it would be kept under review “with a view to extending its scope and ultimately achieving a more complete coverage of PGRFA.”\textsuperscript{161}

Criteria for drawing up a list were discussed and it was agreed that interdependence and food security would be fundamental considerations.\textsuperscript{162} An indicative list of crops and forages was circulated\textsuperscript{163} and the International Plant Genetic Resources Institute was asked to prepare a technical study recommending which PGRFA should be included. The study was presented to the 1998 Fifth Extraordinary Session. It recommended using a genus-based classification system complemented by the gene pool concept, which identifies inter-crossability of species and is therefore useful for identifying crop groups in accordance with their biological unity.\textsuperscript{164} Concerns at the 1997

\textsuperscript{160} Forages refer here to grasses and legumes grazed by domesticated animals.


\textsuperscript{163} \textit{Id.}

Special Session over whether to include the existing ex situ collections of seed banks were addressed by deciding that the collections of members of the CGIAR would be included. This would not cover all IARC collections, some of which are national.165

Following the deadlock in the CGRFA Fifth Extraordinary Session in 1998 over access and other key elements, the CGRFA Chair proposed a smaller informal meeting to further the negotiations. In January 1999, a twenty-two country “informal contact” group met, which was representative of the FAO regions even though the individuals concerned met in their personal capacities. That meeting made dramatic progress and enabled a productive Eighth Ordinary Session in April 1999. All negotiations subsequent to that session were held as informal working group meetings until the concluding stages for adoption of text. Discussions on expanding the list of crops and forages continued up until October 31, 2001, although no changes were made between the CGRFA Sixth Extraordinary Session in June 2001 and the Treaty’s actual adoption on November 3, 2001.166

The final list of thirty-five food crops and twenty-nine forages has been criticised as the shameful product of international haggling.167 Although it covers 80% to 90% of crops most vital to world food security, it excludes many, such as soybeans, groundnuts, sugar cane, wild relatives of cassava, and tomatoes, all of which could be expected to be on a list constructed with food security in mind. Listed forages are largely of temperate origin and under-representative of African and Latin American ones.168 It is reported that not only were developing countries unwilling to facilitate access for developed countries without adequate recompense, but haggling between developing countries led to most of the exclusions. For example, Australia is the only developed country that might have benefited from the listing of tropical forages, while many more developing countries might have benefited. However, developing countries asserted sovereignty over some crops (e.g., Iran/wheat, China/soybeans, Colombia/cassava, Brazil/groundnuts) and refused to add their most prized genetic resources unless others added theirs.169

On the other hand, the list does include certain fruits and vegetables, as well as some staple crops of exclusively regional or local concern (such as taro).170 Industrial crops such as tea, coffee, rubber, and oil palm are

168. Cooper, supra note 4, at 5.
170. Cooper, supra note 4.
excluded, but are largely governed commercially by other commodity specific agreements. While the broad scope of the Treaty would permit the future addition of species to Annex I, the Annex is an integral part of the Treaty and any amendment to the Annex must be decided by the Governing Body by consensus. Given the heated nature of the negotiations on this issue, unanimous consent to new additions by all contracting parties seems unlikely in the near future.

Not all holdings of Annex I crops and forages are subject to the Multilateral System, only those held in the public domain under the management and control of the contracting parties or those that are found in ex situ CGIAR collections. The latter are not limited to ex situ holdings collected prior to the entry into force of the CBD, i.e., they include Annex I listed PGRFA collected subsequent to the entry into force of and in accordance with the CBD. Access to in situ collections of PGRFA listed in Annex I are to be made available under national legislation in accordance with the Treaty. Private collections are not subject to the Multilateral Access regime but are invited to participate.

In addition to Annex I crops, other PGRFA held within the CGIAR-IARCs may also be embraced within the Multilateral System. Thus, PGRFA not listed in Annex I that are collected after the coming into force of the PGR Treaty (and therefore also after the CBD), are to be made available in accordance with the terms on which they were acquired under the CBD or “other applicable laws.” PGRFA not listed in Annex I collected prior to the Treaty’s coming into force are also included in the Treaty’s coverage.

Annex I species held ex situ in private collections or non-Annex I species located in situ or in non-CGIAR collections are simply not yet covered by the Multilateral System.

171. Id.
172. PGR Treaty art. 24.
173. Id. art. 23.3.
174. Cooper, supra note 4, at 5.
175. PGR Treaty art. 11.2.
176. PGR Treaty Article 11 does not impose a temporal limit on coverage.
177. In the absence of national legislation, standards may be set by the PGR Treaty’s Governing Body. PGR Treaty art. 12.3(b).
178. PGR Treaty art. 11.2. Private collections shall be encouraged to participate by the contracting parties. Id. art. 11.3. The Governing Body shall review their participation within two years of the PGR Treaty’s entry into force. Id. art. 11.4.
179. Id., art. 15.3. These would include regional and national laws governing access.
180. PGR Treaty Article 15.1(b) provides that such PGRFA shall be made available pursuant to current MTAs as used under present agreements between the IARCs and the FAO, but which shall be amended to accord with the PGR Treaty by no later than second regular session of the Governing Body. PGR Treaty art. 15.1(b).
<table>
<thead>
<tr>
<th>In Situ</th>
<th>Access within Multilateral System (Art. 11.2), will be provided under national legislation (Art. 12.3(h))</th>
<th>Not covered within Multilateral System</th>
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<tbody>
<tr>
<td>Ex situ/Pre-PGR Treaty (mostly pre-CBD)</td>
<td>Access within Multilateral System (Art. 11.2), pursuant to Part IV (Art. 15.1(a))</td>
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<td>Ex situ/Post-PGR Treaty</td>
<td>Access within Multilateral System (Art. 15.2), pursuant to Part IV (Art. 15.1(a))</td>
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</tr>
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</table>

In relation to access, the 1999 Montreux negotiation agreed that those listed PGRFA to which the Multilateral System would apply could only be used for research, breeding or training for food and agriculture. The Meeting specifically excluded access to PGRFA for other uses, such as pharmaceutical, forestry, chemical, or industrial applications, which would remain subject to bilateral, rather than multilateral arrangements for access. This position is expressly reflected in Article 12.3(a) of the PGR Treaty, which provides that, in the case of a multiple use crop, its importance for food security is to be determinative in facilitating access. This seems to mean that access should be granted to all Annex I crops and forages, irrespective of whether they will be used for research, breeding or training for food and agriculture.

For non-Annex I PGRFA the situation is less clear as their importance for food security has not been considered and access could be legitimately denied. Concerning access for uses other than research, breeding or training for food and agriculture, the PGR Treaty is silent. Therefore, parties might draw guidance from other international instruments, such as the CBD Bonn Guidelines, the FAO

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181. PGR Treaty art. 12.3(a).
International Code of Conduct, or regional arrangements.\textsuperscript{182}

Thus, the PGR Treaty provisions on access combine traits from both the International Undertaking and the CBD. The Treaty's Multilateral System covers a wide range of crops and thus promotes the principle of ensured access to PGRFA for food security, first articulated in the International Undertaking. Other crops held in seed bank collections may also be accessible, depending on the willingness of the individual collection. Conversely, the CBD's principle of national sovereignty over PGRFA is firmly maintained in the Treaty. First, States have the right to make choices as to which crops were and will be included in the Multilateral System, and further, the Treaty places special conditions on access to crops placed within the system after the CBD was created. In terms of PGRFA access, the Treaty's robust combination of traits seeks to protect global food security and national sovereignty.

C. **PGR TREATY - BENEFIT-SHARING**

Article 13 of the PGR Treaty provides that benefits accruing from PGRFA accessed through the Multilateral System shall be shared fairly and equitably, taking into account the CGRFA Global Plan of Action. The sharing of such benefits shall occur through exchange of information, transfer of technology, capacity building, and the sharing of monetary and other benefits of commercialisation.\textsuperscript{183} Each mechanism is carefully qualified, especially technology transfer in connection with protections for intellectual property rights.\textsuperscript{184}

The first three mechanisms are public benefits consistent with current MTA terms under the CGIAR system. As the CGIAR-IARCs have already agreed that PGRFA in their ex situ collections cannot be subject to private property rights, benefits flowing from their development were already understood to be of a common, shared nature.\textsuperscript{185}

The fourth mechanism allows for private commercial development of PGRFA accessed through the Multilateral System, but requires that an equitable share of the commercialised benefit shall be paid into a PGRFA fund.\textsuperscript{186} The fund is to be

\textsuperscript{182} The FAO Code of Conduct is discussed at \textit{supra} Section III.H and CBD's Bonn Guidelines on Access and Benefit-sharing at \textit{supra} Section V.C.

\textsuperscript{183} The 1997 Seventh Session enabled technical work to take place to design a system that shares benefits acceptably. Following progress in the 1999 Informal Meeting, the CGRFA Chair identified agreed elements on benefit-sharing. The CGRFA Secretariat then drafted a Composite Negotiating Text incorporating those agreed elements.

\textsuperscript{184} PGR Treaty art. 13.2(b)(iii).

\textsuperscript{185} Articles 15.1(c) and (d) preserve the CGIAR network, urging Parties to the Treaty to “call upon” the IARCs of the CGIAR to sign agreements with the Governing Body with regard to their ex situ PGRFA collections. PGR Treaty art. 15.1(c)-(d). The Article then sets out terms and conditions upon which such agreements are to be made. Under this system, the IARCs will have control of scientific and technical aspects of PGRFA conservation, while submitting to the authority of the Governing Body on issues of policy guidance.

\textsuperscript{186} PGR Treaty art. 13.2(d)(ii). Payment into the fund will be required under the standard new MTA to be
established under Article 19.3(h) to assist implementation of the PGR Treaty. Therefore, the PGR Treaty follows the approach of the International Undertaking, sharing benefits multilaterally for the conservation and sustainable utilisation of PGFRA. Nevertheless, this payment is not mandatory when the product is "available without restriction" to others for research and breeding. The payment exception for PGFRA, "available without restriction," is purported to ensure mandatory payment by holders of plant patents but not by holders of plant breeders' rights. If so, it is likely to make only a small contribution to benefit-sharing in the near future.\textsuperscript{187} The Governing Body is to grapple with this issue at its first session, deciding on the levels, manners, and forms of payment in line with commercial practice.\textsuperscript{188} In the absence of significant agribusiness practice and in the face of industry opposition, it is likely that the Governing Body will not give robust policy guidance to interpretation of this provision. Actual application of the provision will rest with the holders of collections, especially the CGIAR-IARCs, through amendment of the terms of their MTAs.

Provisions related to intellectual property rights (IPRs) were perhaps found to be the most controversial during the negotiations of the PGR Treaty. If IPRs over PGFRA were permitted, the benefit-sharing concept that underpins facilitated access would be negated. Therefore, Article 12.3(d) restricts IPRs on materials obtained through the Multilateral System:

Recipients shall not claim any intellectual property or other rights that limit the facilitated access to the plant genetic resources for food and agriculture, or their genetic parts or components, \textit{in the form received} from the Multilateral System (emphasis added).

The phrase "in the form" generated much debate.\textsuperscript{189} Is the act of isolating and purifying a gene extracted from a seed a patentable invention of something, different from the germplasm "in the form" received? At the final negotiation, during the thirty-first FAO Conference, the United States called for the deletion

\textsuperscript{187} See Cooper, supra note 4, at 10.


of the IPR restriction provision.\textsuperscript{190} It was the last issue to be resolved and then only by result of a vote that defeated the proposal with 97 opposed, 10 in support, and 3 abstentions.\textsuperscript{191} As the issue rests, original genetic materials received under the Multilateral System may not be patented "in the form" received, but the opportunity to patent the derivatives remains.\textsuperscript{192} The ambiguous meaning of "genetic parts or components" was a compromise that developed countries interpret as allowing some patents.\textsuperscript{193} It seems likely that this contentious IPR provision will come to the Governing Body for further interpretation,\textsuperscript{194} but that it will take a long time to resolve.

A development relevant to identification of derivatives was the adoption in April 2002 of the CBD's Bonn Guidelines, including the suggestion in those guidelines that national patent offices should require disclosure of the origin of genetic resources and traditional knowledge used before an invention can be registered.\textsuperscript{195} Given that the Governing Body is required to establish a working relationship with the Conference of Parties to the CBD and have due regard to the latter's activities,\textsuperscript{196} it is likely to promote this requirement.

Future interpretation concerning IPRs will also be influenced by developments under the Agreement on Trade-Related Aspects of Intellectual Property Rights 1994 (TRIPS). The TRIPS agreement is an annex to the Marrakesh Agreement establishing the World Trade Organisation (WTO). It requires WTO Members to mutually protect IPRs and links that duty to rights under the world trade system. Article 27 of TRIPS requires that patents shall be available and protected by all members but it allows some exceptions for living organisms.\textsuperscript{197}

However, there is no general TRIPS obligation to recognise patents on plants,
though some kind of IPR must be recognised specifically to protect plant breeders' varieties. For example, Article 27 allows flexibility as to the kind of IPR, such as breeders' rights, patents, or other rights designed by the WTO member concerned. The Agreement entered into force on January 1, 1995, and the provision had a review date four years later in 1999. The review was built in due to pressure for a broader obligation to recognise patents on plants and animals.198 However, in 1999 no change was made and negotiations have since stalled.199 In the absence of progress in the WTO, it is unlikely that the PGR Treaty Governing Body, with fewer resources and no built-in deadlines, will make any independent progress on the issue soon.

Finally, it should be remembered that the sharing of benefits flowing from access to other PGRFA outside the Multilateral System (i.e., Annex I species held ex situ in private collections or non-Annex I species located in situ or in non-CGIAR collections) are simply not yet covered. In fact, as the non-Annex I PGRFA are, in the main, not major commercial food crops, they are actually more likely to be used for other profitable applications, such as pharmaceutical or industrial products. Those PGRFA remain outside the scope of the benefit-sharing of the Multilateral System and even the PGR Treaty. They are subject only to bilateral arrangements for benefit-sharing, which may based upon the CBD Bonn Guidelines or other international arrangements as agreed between the parties.

Thus, the PGR Treaty can be considered as having inherited the weaknesses of both its parent instruments in relation to benefit-sharing. The International Undertaking did not address benefit-sharing, while the CBD has not yet addressed the issue beyond listing monetary and non-monetary options. In the Treaty, though, three listed options are oriented to public PGRFA management benefits: (i) exchange of information, (ii) transfer of technology and (iii) capacity building, although a fourth, concerning monetary benefits, remains inchoate.

D. PGR TREATY – TRADITIONAL COMMUNITIES AND FARMERS' RIGHTS

There was a logical congruence between equitable benefit-sharing with indigenous or local communities, as required under the CBD, and rewarding farmers through a fund for Farmers' Rights under the International Undertaking. Under the PGR Treaty, that point of congruence is an ever-retreating mirage. Thus, once again, the Farmers' Rights that are articulated are merely a symbolic expression of gratitude.

The negotiations for a more practical expression were troubled. For example, parties grappled over the issue of who should count as "Farmers." Are they

198. The pressure came from the United States for its biotechnology industries.
indigenous or traditional peoples? Individuals or communities? Who represents them? Are their “rights” human rights, forms of personal property, or IPR? If “Farmers’ Rights” relate to specific benefits for farmers, should benefits belong directly to individuals or communities? Or should they be held and distributed by States as trustees? Or, if the benefits are of a generalised public nature, should their distribution be governed by international mechanisms?

Negotiation positions came to agree on one common feature: a disregard for the option of Farmers’ Rights being held directly by farmers. Thus, they are neither human rights nor shared personal or intellectual property rights. In fact, due to the difficulties in defining the holders of property, this option is virtually without practical effect.200

National positions in the CGRFA negotiations then generally diverged along a North-South line with respect to the international or national control of a more generalised collective benefit.201 The South pushed the view that control over commercial benefits belongs to States of the South, where small traditional farm lots are rich in agricultural diversity. However, the North argued that control over distribution of benefits should rest with the broader international community, which could direct them towards PGRFA conservation through the forum of the CGRFA. Resolution of the controversy depended upon how the benefits were generated. If generated through commercial benefits from bilateral access transactions, then a State setting the terms for access would have the major role in control of the benefits it receives. If the benefits were funds donated as part of an international conservation program, the donor States would have a controlling role.

In April 1999, the CGRFA Eighth Ordinary Session adopted an agreed draft text on Farmers’ Rights that reflected the position of the South. In Article 9.1 of the PGR Treaty, the contracting parties recognise the contribution that local farming and indigenous communities have made, and will continue to make, to the conservation and development of PGRFA.202 However, the language of the

200. For over an hour of a tragic-comic session in 1995, the United States argued that the capitals should be removed from the phrase “Farmers’ Rights,” as they are not formal rights held by individuals, collectives, or States and are merely notional (author’s observation at the Sixth CPGR Ordinary Session 1995).

201. Id.

202. Articles 9.2 and 9.3 elaborate on national responsibilities:

9.2. The Parties agree that responsibility for realizing Farmers’ Rights, as they relate to plant genetic resources for food and agriculture, rests with national governments. In accordance with their needs and priorities, each Contracting Party should, as appropriate, and subject to its national legislation, take measures to protect and promote Farmers’ Rights including:

(a) Protection of traditional knowledge relevant to plant genetic resources for food and agriculture;
(b) The right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture;
(c) The right to participate in making decisions, at the national level, on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture.
Farmer’s Rights provision is internally inconsistent in that it limits the “rights” with voluntary language (i.e., “each party should,” “as appropriate,” and “subject to national legislation”). The rights to participate in decision-making and benefit-sharing, as well as the right to protect traditional knowledge, are further qualified as explicitly subject to national needs and priorities. Therefore, the legal term “rights” in the phrase “Farmer’s Rights” is ultimately symbolic.

Although the provision urges a modest international program for realising the objectives of the system of Farmers’ Rights, all discretion is left to the State of origin. Article 5.1(c) vaguely provides that parties shall “promote in situ conservation of wild crop relatives and wild plants for food production” by supporting “the efforts of indigenous and local communities.” Note, however, that the international commitment to Farmers’ Rights is acknowledged in the preamble of the PGR Treaty. Here, the rights listed in Article 9 are expressed to be “fundamental” to the “promotion of Farmers’ Rights at national and international levels.” Nevertheless, this statement lacks any political force, as it is located outside the main body of the Treaty and is as illusory as the provisions on Farmers’ Rights themselves.\(^{203}\)

Likely reasons for the concession by the North on Farmers’ Rights were the lack of substance in the concept as articulated and a wish to avoid committing new and additional funds to in situ, on-farm conservation in developing countries. Transfer of funds would have been required from the North, whether through donor contributions or benefit-sharing from commercialised PGRFA products. It is at this point that donor reluctance to commit additional funds to the Global Plan of Action on PGRFA translated into the PGR Treaty’s reluctance to fund Farmers’ Rights.

However, a fund of sorts was created. As it stands, the PGR Treaty now provides that the proceeds of benefit-sharing should flow primarily to developing country farmers for the conservation and sustainable utilisation of PGRFA\(^ {204}\) and that the Governing Body shall agree at its first session on the specifics of its funding strategy\(^ {205}\). Part of that strategy is to establish a fund\(^ {206}\) into which benefits are paid from commercialisation of some patented PGRFA accessed through the Multilateral System\(^ {207}\). As noted above, the fund would be small if financed only by payments tithed from PGRFA patent profits\(^ {208}\).

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9.3. Nothing in this Article shall be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seed/propagating material, subject to national law and as appropriate.

204. PGR Treaty art. 13.3.
205. PGR Treaty art. 13.4.
206. PGR Treaty art. 19.3(f).
207. PGR Treaty art. 13.2(d)(ii).
208. See supra note 188 and accompanying text. Those monies paid following commercialisation of a sample supplied by a CGIAR-IARC, in particular, are to be used for PGRFA conservation. PGR Treaty art.
An ensuing related issue was the potentially trade-distorting effect of fiscal measures for PGRFA conservation and sustainable use. Australia proposed language on avoidance of agricultural subsidies disguised as such finance, irking the EU in particular. Some argued that this issue should be dealt with within the WTO rather than FAO framework. The compromise language adopted in PGR Treaty Article 18.4(d) states that "the financial resources provided shall not be used to ends inconsistent with this Treaty, in particular in areas related to international trade in commodities." This obtuse formulation has little legal effect on trade liberalisation, as the PGR Treaty's Objectives and Preamble do not address a level playing field in international trade. Therefore, agricultural subsidies would not be inconsistent with the Treaty. Nevertheless, the provision will provide a point of departure for future argument in the WTO against the legitimacy of certain subsidies for agricultural commodities.

In conclusion, the PGR Treaty's provisions on Farmers' Rights reflect the weaknesses of both the International Undertaking and CBD efforts to address this theme and remain just as unlikely to be fulfilled.

E. PGR TREATY – IMPLEMENTATION AND COMPLIANCE

The Governing Body for the PGR Treaty is to be comprised of all Contracting Parties, each of which has one vote. Its primary function is to promote the full implementation of the Treaty through decision-making on policy direction and guidance, action plans and cooperation, and funding and budgets. All decisions are to be made by consensus, which, as formulated, means unanimity. This reflects a concern to safeguard national interests on the part of major developed countries and to move away from the majority vote approach embedded in the United Nations, which favours developing country interests as U.N. membership grows. Unfortunately, however, unanimity is difficult to achieve, and it bodes ill for implementation decision-making, as it will often drive decisions down to the lowest common denominator.

Much of the membership of the CGRFA is likely to become the Governing Body of the PGR Treaty. This much is implied in the CGRFA's role as the PGR

15.2(b)(iii). Conservation of deteriorating seed bank collections may, in fact, become the primary focus of the fund if it is combined with the Global Conservation Trust fund of U.S. $260 million that is being sought by IPGRI to be raised during 2003. See David Brough, UN Backs Fund To Save Biodiversity, REUTERS, Mar. 5, 2003, reported at Daily Environment News Planet Ark, available at http://www.planetark.org/dailynewsstory.cfm/newsid/20035/story.htm.

211. PGR Treaty art. 19.3.
212. Unless, by consensus, another procedure is agreed upon. PGR Treaty art.19.2.
213. U.N. CHARTER art. 18. A minority of the United Nations' current 191 members is made up of developed countries. For example, only 30 are members of the OECD group of developed country market economies.
Treaty's Interim Committee, pending its entry into force,\textsuperscript{214} and its meeting back-to-back with the Governing Body thereafter.\textsuperscript{215} Similarly, the CGRFA Secretariat within the FAO is likely also to serve as the PGR Treaty's Governing Body, as it is the Interim Committee.\textsuperscript{216}

A Governing Body will, in the normal course, address the implementation problems of particular parties relating to specific legal obligations whose compliance the parties collectively wish to ensure. In the PGR Treaty, those obligations are likely to be the terms set out in MTAs and bilateral access and benefit-sharing agreements. The Treaty provides that, at its first meeting, the Governing Body is to consider "\textit{and approve} cooperative and effective procedures and operational mechanisms to promote compliance . . . and to address issues of non-compliance. These procedures and mechanisms shall include monitoring and offering advice or assistance."\textsuperscript{217} The type of monitoring needed is likely to be problematic. A shortcoming in the PGR Treaty is that it does not impose requirements on its parties to report on their implementation of commitments or on the state of PGRFA under their jurisdictions. Even non-binding predecessors such as the International Undertaking required that much. Although it will take a few years for forty ratifications to accumulate, bringing the PGR Treaty into force, the Interim Committee will need to act early for the Governing Body to meet the first meeting deadline.

Violations of MTA agreements may take place, and in fact violations have been observed.\textsuperscript{218} In response, CGIAR organisations have agreed that the IARCs will voluntarily take actions including: requesting an explanation; notifying the responsible regulatory body in the relevant country that application of intellectual property rights may be inappropriate; notifying IPGRI and FAO; and even taking legal action.\textsuperscript{219} However, little has happened. The PGR Treaty loosely provides that IARCs are to take measures in accordance with their capacity to maintain compliance and to inform the Governing Body of non-compliance, which could suggest that little more will occur in the future.\textsuperscript{220} Nevertheless, the PGR Treaty also provides that the IARCs will recognise the authority of the Governing Body to provide policy guidance, which could include guidance on how to maintain compliance.\textsuperscript{221}

\begin{itemize}
\item 214. FAO Conference Resolution 3.6 (2001).
\item 215. PGR Treaty art. 19.9.
\item 216. FAO 31st Session, supra note 18.
\item 217. PGR Treaty art. 21 (emphasis added).
\item 220. PGR Treaty art. 15.1(a)(iv).
\item 221. Id. art. 15.1(c).
\end{itemize}
MTAs currently used by the CGIAR-IARCs do not provide for tracking the use of germplasm accessed, although it would appear necessary to do so to ensure that the use of any particular accessed material is only for permitted purposes. An objective of the Multilateral System, however, is to obviate the need for tracking individual accessions, which can be cumbersome and expensive. Article 12.3(b) of the PGR Treaty specifically provides that access is to be accorded without the need for tracking.

Therefore, although it will be possible to design measures to promote general compliance, it will be difficult to identify specific non-compliance. The compliance information that the Governing Body could require includes audited national and corporate self-reporting. It could also receive complaints by parties and voluntary submissions by non-parties and by civil society organisations. Procedures to respond to such information include Secretariat or multilateral inquiry processes. Follow up mechanisms could include compulsory payments or suspension of Multilateral System access rights. Whether the Governing Body takes such a robust approach to compliance might well depend on the respective interests of the first forty parties to the Treaty.\textsuperscript{222}

As between parties, the PGR Treaty's dispute resolution provisions conform to the formula characteristic of multilateral environment treaties. There is no compulsory binding decision-making procedure to resolve disputes, and the parties are to seek solutions by negotiation. Failing successful negotiations, they are required to submit to a conciliation procedure, and may elect to submit themselves to binding decision-making by arbitration or the International Court of Justice.\textsuperscript{223} However, it is unusual for multilateral treaty parties to so elect, and more likely that conflicts between parties will be addressed through political processes within the framework of the PGR Treaty's Governing Body.

If a dispute arises concerning compliance with Treaty provisions or Governing Body decisions by an IARC, uncertainty concerning their legal status would confound the PGR Treaty regime. For example, the trust status of IARC germplasm holdings, which ensures that they are accessible to all, is legally questionable. Although recognised as partners in the PGR Treaty, their agreements with the FAO are simply private contracts. IARC seed banks do not possess sovereign immunity and are subject to the laws of the country of their location. Because their legal constitutive documents tend not to make explicit provisions governing the ownership or trust status of the PGRFA held, if a country of location decided to restrict access to seed banks, the locally hosted

\textsuperscript{222} The Interim Committee is unlikely to develop a demanding and costly monitoring procedure, because the Committee will consist of all 161 members of the CGIAR, including those with industrialised plant breeding and biotechnology capacities who would bear most of the burden of monitoring. On the other hand, those CGIAR members may not choose to be early parties to the PGR Treaty.

\textsuperscript{223} PGR Treaty art. 22. Annex II sets out the arbitration and conciliation procedures.
IARC would be obliged to comply.\textsuperscript{224} If an IARC's existence were terminated, its assets (including plant genetic material) would become the property of the host national government.\textsuperscript{225} Fortunately, a dispute over access is unlikely to arise as many accessions are duplicated across various seed banks. However, if a seed bank were to take legal action in a national court to compel benefit-sharing, the matter might be different.

Parties are obliged to provide access for each other to their holdings within the Multilateral System, but they do not carry the same obligations in relation to non-parties; they are merely to encourage non-parties to accept the PGR Treaty.\textsuperscript{226} The Treaty does not otherwise address non-parties.

Japan and the United States abstained from the vote adopting the PGR Treaty and seemed unlikely to ratify it, although the United States has since signed.\textsuperscript{227} Together, they provide U.S. $75 million to fund the CGIAR and they hold substantial ex situ PGRFA of their own. Therefore, it is certain that IARC gene banks will continue to provide access to them and other non-parties, subject to guidance by the PGR Treaty Governing Body, albeit as set out in the legal terms of MTAs. Outside of IARC holdings, other PGRFA within the Multilateral System held by individual countries controlling access are likely to follow the IARC lead. Guidance by the Governing Body can be expected to harmonise their approaches.

Disputes between parties and non-parties (or even between parties) can arise from their rights and obligations under different treaties purportedly inconsistent with each other.\textsuperscript{228} PGR Treaty obligations concerning international exchanges in PGRFA access and benefit-sharing could impact rights under trade treaties. In particular, unclear language in the PGRFA Treaty concerning recognition of plant patents, subsidies for PGRFA conservation/utilisation, biotechnology investment, indigenous peoples' and farmers' rights, or compliance costs, to list only a few, could give rise to purported impacts on trade rights. If a conflict between rights under WTO agreements and those under the PGRFA Treaty came up for binding dispute resolution, which treaty regime should prevail?

\textsuperscript{224} The U.S. Government, for instance, has stated that any material so received would become national property and has admitted that political considerations have dictated the U.S. policy of excluding a few countries from access. See \textit{Fowler & Mooney}, supra note 12, at 193-98; \textit{Kloppenburg}, supra note 11, at 171.


\textsuperscript{226} PGR Treaty art. 31. In contrast, the International Undertaking limited PGRFA access rights to adhering government and institutions. \textit{International Undertaking}, supra note 31, art. 5.

\textsuperscript{227} Details of signature and ratification are given on the FAO website, supra note 152.

\textsuperscript{228} For example, it was successfully argued that the scope of the dispute resolution regime in the U.N. Convention on the Law of the Sea was curtailed by an overlapping inconsistent treaty. \textit{Southern Bluefin Tuna, 2000 I.L.M. 1359} (2000). However, this case decision may be called into question in an emerging dispute over swordfish between Chile and the EU.
This issue was debated through the last negotiation meeting. Ultimately, it was poorly resolved through a compromise that inserted the following two paragraphs into the PGR Treaty’s Preamble:

Affirming that nothing in this Treaty shall be interpreted as implying in any way a change in the rights and obligations of the Contracting Parties under other international agreements;

Understanding that the above recital is not intended to create a hierarchy between this Treaty and other international agreements.

This final language on the PGR Treaty’s relationship with other agreements could be interpreted as having weakened the PGR Treaty, in comparison to both its previous language and that used in some other treaties. Originally set out as an article in the substantive text, rather than in the preamble, the language no longer provides that the PGR Treaty shall not be subordinate to other treaty obligations. It also no longer requires implementation in harmony with other treaty obligations with a view to the goal of sustainable development. In contrast, the CBD uses a substantive article to articulate its relationship with other international agreements, which explicitly states that it can affect other agreements in situations where “serious damage to biological diversity” would otherwise result.

In any case, because there is no binding compulsory dispute resolution mechanism in the PGR Treaty, the likely forum for dispute resolution would be the WTO Dispute Settlement Body, which has compulsory jurisdiction in WTO matters. In a case of conflict between a PGR Treaty-based claim and a WTO-based claim, it is this author’s opinion that the WTO Dispute Settlement Body could be expected to give more weight to WTO obligations.

To summarise, the Multilateral System is the central achievement of the PGR Treaty. The scope of the PGR Treaty covers all plant genetic resources for the purposes of conservation where they are used for food and agriculture, thus overlapping with the CBD. However, the scope of the Multilateral System is

230. The originally proposed language for the PGR Treaty was borrowed from the CBD’s Cartagena Protocol on Biosafety. Its preamble recites that trade and environment agreements should be mutually supportive with a view to achieving sustainable development, . . . this Protocol shall not be interpreted as implying a change in the rights and obligations of a Party under any existing international agreements, [and] the above recital is not intended to subordinate this Protocol to other international agreements.
231. CBD art. 22.1 (“The provisions of this Convention shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement, except where the exercise of those rights and obligations would cause serious damage or threat to biological diversity.”).
232. The relevant WTO obligations tend to be articulated in less ambiguous and more mandatory language. Nevertheless, if the questionable jurisprudence of the Southern Bluefin Tuna Arbitration was applied, it might result in the scope of the WTO agreements being limited. Southern Bluefin Tuna, 2000 I.L.M. 1359 (2000).
limited to PGRFA in those listed gene pools of major food crops and other PGRFA in the "public domain" or "under the management and control" of Parties to the Treaty. This means that in terms of access, the PGR Treaty leaves gaps, although it fills most of the gap in the CBD access regime concerning PGRFA collected prior to the entry into force of the CBD. With regard to the sharing of benefits derived from material accessed through the Multilateral System, the PGR Treaty supports a public benefit approach where access is for the purposes of research, breeding, and training to advance food security. On the thorny issue of sharing benefits arising from commercial development, however, the PGR Treaty requires that an "equitable share" be paid into an international fund and leaves many questions unanswered. Further, as it does not apply to derived commercial products not used for food and agriculture (i.e., for chemical, pharmaceutical, or industrial) purposes, additional guidance on benefit-sharing must be had for these from other sources, such as the CBD Bonn Guidelines and emerging international practice. Finally, with respect to Farmers’ Rights, the PGR Treaty allows total national discretion in their implementation, and what substance remains in them is actually in the Treaty’s references to the Global Plan of Action, which addresses the related issue of in situ conservation.

VII. Conclusion

The first decade of the 1983 International Undertaking was troubled. Unreconciled interests at an international level hampered its implementation, and the 1989 and 1991 annexes were awkward political accommodations that resulted in highly ambiguous text. In 1992, the CBD haplessly tried to define the central condition of access to biological resources generally by claiming a fair bilateral share in the benefits of biotechnology. Its provisions did not explain how this was to be achieved and, in the 1990s, little progress was made within the framework of the CBD to realise these claims. Skeptics might reasonably conclude that, for practical political and economic reasons, an international framework for bilateral benefit-sharing is largely unachievable.

However, in terms of the more limited context of PGRFA, multilateral benefit-sharing opportunities were explored through the second decade of the International Undertaking by means of negotiations for its revision, due to its having been superseded by the CBD in certain areas. As there is negligible conflict between FAO and CBD approaches to conservation of PGRFA, it was essentially in connection with access and benefit-sharing that revision and harmonization were necessary. Also, during the 1990s, relevant FAO institutions and instruments matured at a pace that outran the revision negotiations. Thus, the FAO improved its information base for PGRFA management, developed a comprehensive PGRFA management plan, and adopted codes relevant to PGRFA access and benefit-sharing. The consolidation of these institutions and arrangements around the International Undertaking influenced its reformulation.
The resultant PGR Treaty is a hybrid that more closely reflects the maternal lineage of the International Undertaking than the CBD that was grafted onto it. Its focus is on traditional FAO concerns, such as food and agricultural uses, food security, exchange of plant genetic resources based on free access, non-proprietary product development, and multilaterally assisted conservation. Its scope reflects that of the International Undertaking, and its central strength, the Multilateral System for access to PGRFA, builds on the CGIAR seed bank network that, with the International Undertaking, is part of the Global Plan of Action for Plant Genetic Resources. The FAO’s Global Plan of Action on PGRFA provided a ready-made implementing strategy for the PGR Treaty’s objectives in the areas of conservation and, perhaps, Farmers’ Rights. However, unlike the International Undertaking, the PGR Treaty will be legally binding when it enters into force, taking on a quality inherited from its relationship with the CBD. It also has the CBD’s features of sovereignty over plant genetic resources, premised on prior informed access to them and benefit-sharing of their proceeds, albeit on a multilateral basis. The PGR Treaty, therefore, combines the main strengths of each parent instrument. It meanwhile avoids some of their weaker features. For example, the information network of the FAO Global System for PGRFA was not considered suitable for incorporation in the Treaty and the rights of traditional communities and farmers are given only lip service.

However, the Treaty leaves several gaps concerning PGRFA to be filled, also inherited from the International Undertaking and the CBD, with regard to important access and benefit-sharing issues in the Multilateral System. These include the questionable adequacy of the current list of crops and forages, the future inclusion of non-Annex I or non-CGIAR-IARC holdings, the uncertainty of scope for intellectual property rights on products derived from accessed PGRFA, and the unspecified range of commercial sources to be levied for contributions to the PGRFA fund. Beyond those unresolved issues, shortcomings also remain in the Treaty concerning in situ conservation, the structure of PGRFA status information networks, and a meaningful compliance system. Mechanisms to address in situ conservation and information networks currently rely on relatively weak elements in the FAO Global System. Further, farm and other in situ conservation strategies are needed to complement IARC seed bank efforts, and information exchange needs to be situated beyond the FAO. While the FAO itself has the institutional will to address these matters, its effectiveness is questionable, as its centralised approaches to them do not optimise an environment where there are many other important and diffuse actors. The gap in compliance procedure goes to the heart of the Treaty itself. The will and commitment of the Governing Body in setting up a compliance information system will indicate the Treaty’s prospects for success.

It seems that CGRFA members defined and refined their areas of disagreement over seven years but exhausted the possibilities of finding solutions on the above
matters. But the tasks left to the Governing Body are less daunting than the road already traveled. It took the representatives of CGRFA members three years just to begin to come to grips with the technical complexities of grafting together complicated regimes for agricultural development and biodiversity conservation. Even then, they did not make significant progress in full plenary sessions but only in smaller informal sessions, where expertise was concentrated. A lesson in this for the Governing Body (and Interim Committee) is that it needs to form smaller working groups to make progress on technically complex problem topics. The PGR Treaty’s future implementation will rely on their creative and constructive decision-making.

The Governing Body alone cannot address the PGR Treaty’s shortcomings concerning benefit-sharing, however. The PGR Treaty is now part of a regime system that interrelates many institutions, including the FAO, CGIAR, CBD, WTO, and WIPO. Within the regime complex, the FAO, CGIAR, and CBD institutions can be visualised at the core, and the WTO and WIPO at the periphery of sustainable agriculture concerns. Core harmonisation between the FAO, CGIAR, and CBD institutions in relation to PGRFA has been successful largely because their goals, such as promoting broad dissemination of PGRFA, are congruent. However, their divergence from certain goals articulated through the WTO and WIPO, such as controlling dissemination of intellectual property, has ensured that controversies remain embedded in the text of the PGR Treaty. These centre mostly on property ownership transfers via PGRFA, patents, and levies between the developed and developing worlds. The resolution of these differences is an incremental process of which the evolving Treaty is an important part.

In the end, was the paper used over seven years of negotiations worth the trees? In this author’s opinion, the answer is yes! Despite the shortcomings, the PGR Treaty will operate to ensure the availability of PGRFA, simplify transfers, promote fairness in benefit-sharing, and direct some benefits towards PGRFA conservation. It integrates cross-sectoral interests to form a legal framework for the conservation and distribution of PGRFA. It is the only global sustainable agriculture treaty and represents a new direction in international law. From this first hybrid, branches will grow and many seeds will sprout.


234. For future negotiation of cross-sectoral, sustainable development treaties, it is likely that similar informal working group strategies will be needed to progress a text. At the same time, the small number of participants in these groups will pose difficulties for inclusive participation by all countries.