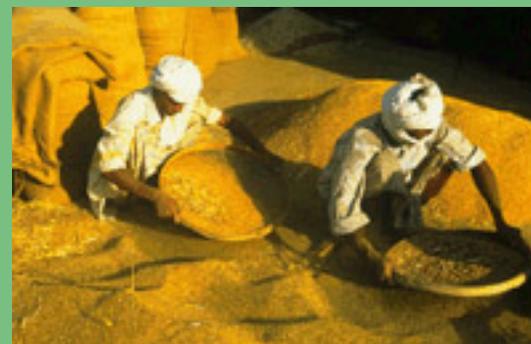


WHY GOVERNMENTS CAN'T MAKE POLICY



The Case of Plant
Genetic Resources
in the
International Arena



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Abbreviations

| | |
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| ARS | Agricultural Research Service |
| CBD | Convention on Biological Diversity |
| CGIAR | Consultative Group on International Agricultural Research |
| CIAT | Centro Internacional de Agricultura Tropical |
| CIMMYT | Centro Internacional de Mejoramiento de Maíz y Trigo |
| CIP | International Potato Center |
| EU | European Union |
| FAO | UN Food and Agriculture Organization |
| GDP | gross domestic product |
| GMO | genetically modified organism |
| IBPGR | International Board for Plant Genetic Resources |
| ILO | International Labour Organization |
| IPGRI | International Plant Genetic Resources Institute |
| IPR | intellectual property right |
| IRRI | International Rice Research Institute |
| IU | FAO International Undertaking |
| LMO | living modified organism |
| MAI | Mutual Agreement on Investments |
| NBPGR | National Bureau of Plant Genetic Resources |
| NGO | Nongovernment organization |
| NPGS | National Plant Germplasm System |
| OECD | Organization for Economic Cooperation and Development |
| PBR | Plant breeders' rights |
| PGR | Plant Genetic Resources |
| PGRFA | Plant Genetic Resources for Food and Agriculture |
| PVP | Plant Variety Protection |
| SADC | Southern African Development Community |
| SGRP | Systemwide Genetic Resources Program |
| Sida | Swedish International Development Cooperation Agency |
| TRIPs | Trade Related Aspects of Intellectual Property |
| UN | United Nations |
| UNCTAD | UN Conference on Trade and Development |
| UNDP | UN Development Programme |
| UNEP | UN Environment Programme |
| UNESCO | UN Economic, Social and Cultural Organization |
| UPOV | Union for the Protection of New Varieties of Plants |
| WHO | World Health Organization |
| WTO | World Trade Organization |

Foreword

This report calls attention to a very serious threat to further agricultural progress, yet a threat which is not widely recognized and whose urgency is grossly neglected: the damaging consequences for agricultural research resulting from the current stalemate in the international negotiations on genetic resources for agriculture. The paralysis resulting from the inability of governments to compromise and reach agreement is a very real threat to the continuation of the current international activities aimed at conserving and utilizing genetic resources for agricultural purposes. As the international stalemate continues, and indeed deteriorates, more restrictions to access are being contemplated, mainly in developing countries, as direct responses to the increasing number of patents being granted with wider and wider scope of protection in developed countries. Admittedly, conflicts over the ownership and use of plants are ancient, dating back at least several thousand years. But the current crisis is made particularly urgent because of the critical role which modern plant breeding has played in the spectacular agricultural progress of the recent decades and because continuing that progress is essential for achieving food security, particularly for the poor in developing countries, in the future. The tragedy is that unless the international community becomes much more aware than it is now that the current drift is caused by the pursuit of narrow, often obscure and questionable national interests, and threatens a collective undertaking which has been very successful, nothing will break the current logjam.

The main point of the study reported here is to call attention to the nature of this stalemate and to its main causes. Exploring policy making at the national level in a small but purposely selected sample of diverse countries, the study provides the reader with an "explanation" of why national positions in international negotiation fora are diverse, sometimes conflicting and almost always rigid. The issues being obscure and arcane, while the stakes are important but will probably be felt only in the long term, negotiators in a forum such as the Commission on Genetic Resources for Food and Agriculture do not have the authority to strike meaningful compromises; and they even do not have access to the upper echelons of the government bureaucracy which could have such authority.

The Study was initiated as a result of the deep concerns among staff of the Agricultural Research and Extension Group of the World Bank (then known under the acronym ESDAR) and of the Research Department (SAREC) of the Swedish International Development Cooperation Agency (Sida) for the threats to international agricultural research, resulting from these international disputes on genetic resources. Sida provided significant financial resources for the conduct of the study. Others, particularly in France, Germany and the United States provided additional support, in kind or in cash.

The authors are, of course, grateful for these supports as well as for the encouragement they received from their respective senior managers. Many others made this work possible. First thanks are gratefully extended to the authors of specific country case studies: Marcio de Miranda Santos for Brazil, Detlef Virchow for

Germany, Andrée Sontot for France, John Mugabe for Kenya, and Ben Malayang, III, for Philippines. The case study for India was conducted by Michel Petit, who is grateful to the many individuals who agreed to be interviewed and gave generously of their time. A special mention must be made of Dr. M.S. Swaminathan who provided invaluable guidance. The case study for Sweden was really derived from the seminal work done and published by Bo Bengtsson and Carl-Gustaf Thornström. Actually that work provided the initial inspiration for this entire study. Finally, no real case study was ever written for the United States. Several of the authors, who were themselves familiar with the US situation, provided insights. In addition Michel Petit and Gesa Horskotte-Wesseler conducted interviews of a few key individuals. Special mention must be made here of the help received from Henry Shands, who gave generously of his time and provided detailed comments of various preliminary papers prepared during the course of this study.

Gesa Horskotte-Wesseler provided invaluable intellectual and material assistance during the two years she spent at the World Bank in 1998 and 1999. Phil Pardey from IFPRI was a member of the study Steering Committee. He provided very useful insights on his own economic research work concerning genetic resources for agriculture. Finally, Sally Antrobus edited the manuscript. These three contributions are particularly acknowledged.

Finally the authors thank CIP for publishing this report.

Michel Petit
Chair
Study Steering Committee

Executive Summary

This study emerged from an alarming and growing concern about the progress of international negotiations on issues of genetic resources. The inability of governments to compromise and reach agreement is a very real threat to the continuation of the current international activities aimed at conserving and utilizing genetic resources for agricultural purposes. As the international stalemate continues, and indeed deteriorates, more restrictions on access to plant genetic resources for food and agriculture are being contemplated without a clear vision of the future impact of, and often in response to, external driving factors such as the increasing number of patents being granted with wider and wider scope of protection.

The specific purpose of the study was to clarify issues and to inquire whether or not the complexity of the interrelationships among different international fora might contribute to the obscurity of the policy debates on genetic resources at both the national and international levels, thereby pointing out reasons for the near-complete paralysis in reaching decisions. To do that, the study reviewed current issues in genetic resources for food and agriculture, and analyzed decision-making at the national level in a small but purposely selected sample of very diverse countries, namely Brazil, France, Germany, India, Kenya, The Philippines, Sweden, and the United States. The focus on decision making at the national level was based on the assumption that positions taken by government representatives in various international fora critically depend on the nature, content and process of policy making at the national level.

In each case knowledgeable people, involved in agricultural genetic resources policy making and the corresponding policy debates, were interviewed. An account of recent relevant decisions and debates was written up, pointing out the major actors involved, such as NGOs, research organizations, industrial representatives, etc., and also the array of government ministries which participate. The interests and concerns these actors represent and express were identified. Implications from these analyses for the national positions taken in international negotiation fora were drawn, thereby providing an "explanation" for these positions and for the great difficulty of negotiating compromises among these national positions.

In the process, the study has placed the current debate in its historical context and has emphasized the wide range of interpretations of the meanings, uses and values of genetic resources to different societies and cultures. It has provided insights as to the roots of the current stalemate, both in these social and cultural interpretations and the way they are manifested in national decision-making processes.

In addition, one readily apparent explanation of why it has been extremely difficult to reach international consensus is indeed the complexity of the international negotiation processes involved. The international negotiations on plant genetic resources take place primarily in the Commission on Plant Genetic Resources for Food and Agriculture whose secretariat is provided by FAO. But deliberations in that

forum are closely interrelated with negotiations in other international fora, particularly in the Conference of Parties of the Convention on Biological Diversity and those in the World Trade Organization regarding Trade Related Intellectual Property Rights. The negotiators in these fora are often from different ministries. That need not be a problem in countries which are well equipped to escalate issues to the level at which ministries can and must interact to remove contradictions and harmonize positions which will apply across fora. Sadly, that is seldom the case for genetic resources issues in most countries and the resolution of critical issues eludes negotiators in any specific forum.

A second similarly obvious explanation is the complexity of the issues themselves and the magnitude and scope of differing viewpoints within even a single country. The combination of a complex international negotiation process and a complex set of issues with tremendous long term social, economic and political impact is the perfect setting for a breakdown of international consensus on the issues of genetic resources.

Nowhere are the consequences of this lack of consensus more severe than in those international organizations which produce international public goods based on conserving and using genetic resources. The research centers of the CGIAR constitute the most obvious example of such organizations. Until agreement is reached which would allow these centers to continue to operate under an umbrella of free and open access, at least for major food and agriculture crops, then the ability to produce international public goods is threatened. This unique role, by definition, will not be assumed by the private sector, nor by the national research institutions in developing countries, nor by any other of the single stakeholders in the debate. At a minimum, the results of this study would indicate that all countries would benefit by providing a special status in their national legislation for the international collections held in trust and for the benefit of humankind. Such a special status would insure that they continue to be freely available and in the public domain.

The maintenance of present day yield levels for major food crops will depend on combining many genetic traits found in materials of a wide variety of origins, that must be placed into a wide range of varieties and used in many different locations. Future food security depends on it and international public goods deliver it. Most of all, this study has emphasized the implication for a potential loss of those international public goods and the resulting threat to all countries. Thus we hope that this study can contribute to a greater awareness of the current threats and constitute a call to action.

Introduction

International negotiations on genetic resources for agriculture have progressed very little and very slowly since they were initiated following the adoption of the Convention on Biological Diversity (CBD) in 1992. This slow pace of progress poses a major threat to agricultural research. Indeed, crop breeding is probably the direct cause of a significant share, perhaps one third to one half, of productivity increases in agriculture over most of the twentieth century. And crop breeding has been based on easy access to a wide array of genetic resources used for crop improvement.¹ That easy access is threatened by recent developments in a growing number of countries, reacting to the absence of a comprehensive international agreement on access to, but also conservation and use of, genetic resources, including rules on how benefits derived from the use of genetic resources, often coming from a variety of sources, should be shared. For the international agricultural research centers supported by the Consultative Group on International Agricultural Research (CGIAR), the threat is particularly serious; their very existence may be at stake, since their most important activity ("germplasm improvement") is based on the intelligent facilitation of the international circulation of large volumes of germplasm. For them, any hindrance to the free circulation of germplasm hits at the heart of their contribution.

The international negotiations on Plant Genetic Resources (PGR) take place primarily in the Commission on Plant Genetic Resources for Food and Agriculture (PGRFA), whose secretariat is provided by FAO. But deliberations in that forum are closely interrelated with negotiations in other international fora, particularly in the Conference of Parties of the CBD and those in the World Trade Organization (WTO) regarding trade related aspects of intellectual property rights (TRIPs). This complexity of the negotiation processes involved is already a first explanation of why it has been extremely difficult to reach an international consensus.

Accordingly, the primary purpose of the study presented in this report was to clarify the issues and the interrelationships among negotiating fora, as it was felt that the complexity of the issues themselves and of the processes involved, as well as the resulting lack of transparency, could explain the lack of progress or at least its very slow pace. But it soon became clear that in order to understand the interrelationships among the various intergovernmental negotiation fora, an understanding of the processes of negotiation was necessary. This led to the recognition that these international negotiations take place among national government representatives. And in order to understand why a national delegation takes a given position on an issue, it is necessary to analyze the concerns and pressures exerted on the national government to which that delegation is accountable, and also, of course, the nature of that accountability. In this respect, each national

¹ The key feature of crop improvement through breeding is the introduction into the genetic makeup of crops of new genes bringing some desirable property, such as resistance to a given pest. Until recent progress in biology, the only sources of really new genes for modern crop varieties were the crops' wild relatives and the landraces selected and conserved over the years by generations of farmers in their traditional communities. With the advent of what is commonly called "genetic engineering," other sources of genes may become available; however, nothing indicates that wild relatives and traditional landraces will lose their usefulness.

situation is special. The most practical way we could imagine of tackling that difficulty was to conduct case studies on a purposely-selected sample of countries, representing a wide array of national situations. This analysis at the national level revealed several important features of the negotiation processes, particularly the fact that individual country positions are diverse, often in conflict with one another and not flexible, which indeed explains at least partially the slow pace of progress. As a result, one must be pessimistic on the future of these international negotiations. Unless the international community becomes much more aware than it is now that the current drift is caused by the pursuit of narrow, often obscure and questionable national interests, and threatens a collective undertaking which has been very successful, nothing will break the current logjam.

Given these considerations, the outline of this report is straightforward. It begins with a review of current issues and a description of possible causes of the stalemate at the international level. The second chapter is devoted to an analysis of decision-making at the national level in eight countries (Brazil, France, Germany, India, Kenya, the Philippines, Sweden, and the United States). The third chapter draws the implications of the analysis for the conduct of the international negotiations, and Chapter 4 addresses the consequences for the CGIAR of the international stalemate on genetic resources.² Finally, we call on the international community to act without further delay on an issue that is of great importance but is not perceived as such, because it is arcane and also probably because it poses a real threat only for the long term.

² In addition, given the fact that international negotiators must ultimately agree on a legal text and given the importance of the issues related to access to plant genetic resources, a special appendix presents these legal issues in some detail.

Chapter 1

Genetic Resources for Agriculture: An International Stalemate?

I. Historical Introduction and Overview

Conflicts over the ownership and use of plants are ancient, dating back at least several thousand years (Harlan 1975a). In more recent but still distant colonial times, the great powers of the day strove to gain commercial and military advantage through the control of plants such as sugar, tea, rubber, cinchona, and indigo, among others (Crosby 1986). These latter conflicts, like their modern counterparts, arose as commercial possibilities began to open up and as companies and countries began to acquire the organizational and technological capacity to develop or process the plants and to create a market (Fowler 1994).

Prior to the late nineteenth century, attention was focused on identifying potentially valuable plants (e.g., medicinal and industrial plants, spices, and similar high-value items) and on exploiting the commercial market for those species. The development, control and exploitation of specific, differentiated varieties of domesticated crops became increasingly important with the emergence of commercial, market-oriented agriculture, and even more important later as scientific plant breeding and improvement took hold. By this time, ownership and control could not legitimately or effectively be asserted through military might. And yet, both the marketplace and commercial interests were sufficiently developed to make mechanisms for control of plant varieties financially attractive and desirable.

How, for example, could exclusivity of ownership and marketing rights be achieved for the "Red Delicious" apple, discovered as a chance seedling on an Iowa farm in 1868, and purchased from the farmer by Stark Brothers Nursery (Nichols 1976)? Multiplication of the particularly popular variety was easily accomplished through grafting, a technique most farmers understood. Similarly, seed of unique varieties of domesticated crops could be saved and replanted, depriving any would-be owner of the variety of potential sales. The biological barriers to the transformation of varieties into proprietary commodities were significant. The practical and legal barriers, however, proved surmountable.

As early as the 1870s, the nursery industry in the US suggested that patent and trademark protection be made available for plants (White 1975). The passage of the first legislation specifically intended to make intellectual property rights protection available for plants occurred in 1930 in the US. Similar laws were soon passed in other countries: Germany in 1933, Austria in 1938, and the Netherlands in 1941.

For various reasons, there was more resistance to the idea of providing patent or patent-like protection to important food crops, particularly those that reproduced by and were exchanged or sold as seeds. The North American and European "seed industry" was also more heterogeneous in its structure and interests, and less

organized than the nursery industry—less able, in other words, to mount sufficient political pressure to secure heretofore unrecognized rights over crop varieties. Moreover, at the turn of the century there was little serious, scientific breeding of crop plants. It should be recalled that Mendel's laws of heredity were only rediscovered in 1900, and it took some time for their validity and utility to be recognized and put into practice. Mendel himself—like others in the years immediately following 1900—doubted whether his findings applied to plants other than peas (Mayr 1982). Not surprisingly, there was not a large market, among farmers, industry, or consumers, for particular varieties of field crops. Neither the marketplace nor the scientific techniques necessary for formal crop-breeding programs were sufficiently developed to create the conditions for supply or demand.

Discussions within the seed trade in Europe began to take place in the 1950s with the aim of establishing a system for intellectual property rights covering plant varieties. In 1961, six European countries came together to found the Union for the Protection of New Varieties of Plants (UPOV), securing a potent tool for use in marketing varieties of sexually reproduced plants. As of October 1998, UPOV had a membership of thirty-eight countries.

The shift in the locus of economic value from the species to the variety level—and particularly to those varieties fashioned through breeding programs—meant that there was little to be had from trying to claim ownership or exercise control at the species level, as during colonial days. Heterogeneous landraces (farmer-produced "varieties") came to be described as the "common heritage of mankind" precisely as they came to be used as raw materials by trained plant breeders. Thus, by the mid-1950s, a complete shift in philosophy and practice had taken place regarding these biological materials—from claims of national sovereignty and other associated rights and privileges, during the colonial era and before, to an assertion that the materials represented a common heritage and that ownership could only accrue to those who had the capacity to manipulate this material and to create a new variety that was distinct, uniform, and stable.

Significantly, the model of property rights adopted was compatible with the notion of common heritage. The rights were to the variety—in other words, to a certain combination of genes. The raw materials, the genes, were still considered "common heritage" and available for use. It was only the combination—the formula—that was owned.

Variety-focused intellectual property rights protection spread, as evidenced by the growth in UPOV membership. Such legislation, often termed "plant breeders' rights" or "variety protection," continues to spread. But with the rapid expansion of knowledge in the biological sciences, especially that associated with "biotechnology," it became possible to contemplate protection of new types of "inventions" and of new categories of biological materials, including genes and gene constructs, traits, microorganisms, animal breeds, etc. Late in the 1990s, the list is growing as technology advances, as the marketplace develops to accommodate products of the new technologies, and as commercial interests act to secure advantages for themselves through the creation of favorable new laws, court rulings, and regulations. The increasing ease with which genetic materials can be

manipulated, including the movement of genes across species “boundaries,” coupled with the arrival of commercial products from the “biotech” industry, has combined to push the locus of value from the species and variety level to the gene level itself. New biological and computer technologies have helped both to uncover and to add value to genetic resources.

The age-old conflicts over access and ownership continue, even though the circumstances may be different today. Still at issue is the question of which biological materials remain in the public domain and which can be privatized. What criteria will be used in determining ownership? Will access to genetic resources be regulated, and if so, under what terms? Will there be free, open access? Or will some sort of payment or “benefit sharing” be required? Who will bear the responsibility of conserving genetic resources? What sorts of institutions, systems, and agreements will be necessary?

In such turbulent times, social institutions typically come under stress. Established rule systems cannot easily or effectively be applied to new problems or to old problems in new contexts (Burns and Flam 1987). Legal systems, in particular, are challenged as actors attempt to reform and rewrite laws to fit new circumstances, to meet new needs, and to serve newly identified interests. The period of the last forty years has been one in which traditional property arrangements and assumptions have been under constant pressure, and in which increasingly precise definition has been given to what is owned and who owns it—and, indeed, to what ownership actually means (Greenfield 1989). In multiple ways and in multiple fora, societies have been grappling with the fundamental question of what parts of biological diversity will remain in the public domain and what parts will be open and available for private ownership. It is quite understandable that such a contest has arisen during an era in which rapid technological advances have prompted changes in the way we think about, use, and value biological diversity.

- Agriculture-related biological diversity serves a purpose and is valuable
 - as part of the larger ecosystem;
 - in the farmer’s field in the form of crops (and potential income);
 - as a raw material for the breeding of new crop varieties; and
 - as food and other products for human beings.

Some groups may use and appreciate biological diversity for cultural or spiritual purposes. Governments may consider it a tool to use for national development or a resource to sell, just as they might view copper ore or handicrafts. Others may feel that lack of access to genetic diversity constitutes a threat to survival or economic well being.

Agro-biodiversity plays such a thoroughgoing role in our daily lives that it is no surprise to find many different groups profoundly interested in it. National governments are typically organized into ministries or departments responsible for particular areas of endeavor: agriculture, environment, foreign affairs, trade and commerce, finance, justice, and so on. Each has its own history, interests and viewpoints, and its own “culture” or way of doing things. Each is amenable or

vulnerable to different pressures or outside interest groups. Each is accountable to the others or the body politic in different ways. And each will be interested to some degree in some aspect of biodiversity.

Depending on how the issue is defined, the subject of agro-biodiversity can be debated in any of a number of international fora or in multiple fora simultaneously. It can be the subject of debate and negotiation in several of the specialized agencies of the United Nations (UN), among them the FAO, UN Development Programme (UNDP), UN Environment Programme (UNEP), UN Conference on Trade and Development (UNCTAD), World Health Organization (WHO), International Labour Organization (ILO), UN Economic, Social and Cultural Organization (UNESCO), the WTO, through the UN's Commission on Sustainable Development, or through the mechanism of a treaty such as the Convention on Biological Diversity. Each might assert a logical claim to consider some aspect of the topic. Governments might pursue their interests in any of these fora, choosing the one or the combination that offers them the greatest advantage. Some governments—or rather, some ministries within some governments—may consider it useful to try to define the issues as trade issues, others may view them as environmental issues, and still others as agricultural or development issues. In each case a different forum would be indicated as the ideal location for a struggle thus framed.

The multiplicity of interests and fora, and the existence of several debates or negotiations taking place simultaneously, can tax the resources of even the largest governments and can lead to poorly coordinated, inconsistent, and even contradictory policies. To some extent, contradictory policies may simply demonstrate the fact that different interests and views exist within the government. Contradictions and inconsistencies may, amazingly, be quite logical and purposeful. But in many cases, ragged and inconsistent policies can also be explained in simpler terms of poor planning or weak coordination and priority setting. More troubling is the fact that discordant views enunciated by governments in different negotiating fora can lead to lack of progress or stalemate in all fora.

The need for the nations of the world to act cooperatively to conserve, develop, use, and share the benefits of biological diversity is obvious. Research for this study began with a certain presumption: that governments may not be consciously and purposefully developing clear and consistent policies regarding biodiversity. Furthermore, they may be organized in ways that render policy making on “cross-cutting” issues, or matters of technical complexity, almost impossible. The study proceeds with another presumption: that examining the issues—their origins, content, and interrelatedness—may help policy makers deal with the subject in a more comprehensive and holistic manner. Finally, we assume that readers might benefit from a closer look at how governments are coping, in reality, with the predicament of developing policies on this complex subject. In this regard, a number of case studies were undertaken. The findings of these studies are summarized here, with the aim of drawing lessons that might help others.

First, however, a more detailed examination of the history and content of the debate is in order to provide context for the main body of this report focusing on government policy making toward biodiversity.

FAO: The Modern Debate Begins

The first warning bells sounded rather quietly. Harry Harlan and M. L. Martini, writing in the USDA *Yearbook of Agriculture* (1936), noted that crop diversity was being lost and that the loss was both tragic and irreversible. Harlan's son, Jack, sounded the alarm with more intensity, writing a series of eloquent and emotional articles in prestigious scientific journals in the early 1970s (Harlan 1972, 1975b).

In 1974, the International Board for Plant Genetic Resources (IBPGR) was founded, with one foot in the CGIAR organizationally and the other in FAO. Conservation activities increased dramatically. Collecting expeditions were mounted; genebanks were constructed; and a "system" for securing the world's plant genetic resources began to take shape tentatively in this atmosphere of growing crisis.

Concerns over the loss of genetic diversity in agriculture were first raised as a political issue at FAO in the late 1970s, both by activists (such as representatives of the Rural Advancement Foundation International, Genetic Resources Action International, International Coalition for Development Action, and International Organization of Consumers Unions) and by a number of developing countries, principally Mexico at that time.

The latest developments in biotechnology could not easily have been anticipated in the late 1970s, when the modern debate over plants and genetic resources began in earnest. However, legal regimes (e.g., UPOV) providing breeders of new varieties with tools for securing benefits in the marketplace were well ensconced. Missing were any formal mechanisms through which farmers, the would-be "owners" or developers of landraces or farmers' varieties, might extract similar benefits, either individually or as a group. Because such resources were considered as "common heritage," claims of national sovereignty were rarely asserted. Indeed, these "raw materials" for the modern seed industry, improved as they undoubtedly had been by generations of farmers, were a free resource, a public good.

Nevertheless, the original goals of those who raised the issue of genetic resources at FAO were surprisingly conservation-oriented. Mexico was quickly backed by other developing countries in asserting that plant genetic resources were the common heritage of mankind and that as such, countries had to recognize their common responsibilities for the safeguarding of these resources. Mexico and its allies became convinced that the loss of genetic diversity might reduce the options open to them for agricultural development.

Initial demands centered around proposals to create an FAO Commission on Plant Genetic Resources (a permanent forum where governments could address issues), an IU (a loose commitment to conservation and open access to genetic resources), and an international fund (to support conservation efforts). The FAO Commission was created in 1983 and held its first meeting in 1985. After bitter fights, it adopted a nonbinding Undertaking in 1989, and established—on paper—a fund.

The Commission is now home to the renegotiation process for the IU—a process aimed at bringing the Undertaking into line with the CBD (discussed later). It has held a number of negotiating sessions in recent years but has yet to make substantial progress on the major issues and "trade-offs" of access and benefit sharing. If the

current stalemate persists much longer, countries will probably terminate negotiations, choosing by default to live without a specific international agreement or set of standards regarding the exchange of PGRFA.

As already noted, the existence of multiple fora for the negotiation of issues regarding plant genetic resources complicates the task governments face in formulating and coordinating their policies and negotiating positions. Typically, ministries of agriculture have the mandate to represent their respective governments in FAO negotiations. Numerically, these ministries dominate the list of delegates for FAO Commission meetings, though foreign affairs ministries have begun to appear in recent years as the heat of the negotiations has pushed consideration of the issue to higher levels in governments.

Given FAO's institutional history and culture, debates tend to be grounded in agricultural and development concerns. Invocations of other arguments, values, and terminology suffer from an inherent disadvantage in this particular forum.

The Convention on Biological Diversity and Bilateralism: The Debate Takes a Turn

The 1992 "Earth Summit" in Rio de Janeiro and the resulting Convention on Biological Diversity capped several decades of increasing public concern over loss of diversity. At the time whales, seals, dolphins, gorillas, tigers, sea turtles, and elephants, among others, all had organizations dedicated to their preservation, for example. Then as now, attention focused primarily on diversity and loss at the species level.

Within-species diversity received comparatively little attention in the preparatory process leading to the Rio summit, and agriculture-related biodiversity never really appeared on the radar screen of the environment ministry delegates and conservationist non-government organizations (NGOs). In Rio, biodiversity was wild, and it was measured in numbers of species and in species extinction rates.

Early proposals for a world treaty "on the conservation of species and ecosystems" foresaw activities to be supported by an international fund (de Klemm 1984). Compared to the final wording of the CBD, these initiatives were decidedly multilateral and noncommercial in their approach.

While the years leading up to the signing of the Convention were years of growing international concern over the environment, they were also years in which expectations of the future value of biodiversity rose with each stunning prediction and breakthrough from the emerging biotechnology industry. A year after their first successful experiment with genetic engineering, Herbert Boyer and Stanley Cohen each put up \$500 of their own money to launch Genentech. Four years later, in 1980, they took the company public, offering just 16% of its stock (1.1 million shares) at \$35 a share. Within twenty minutes of its offering, the stock was selling for \$89 a share, and the company had a valuation of over \$500 million (McAuliffe and McAuliffe 1981). Court cases (e.g., *Diamond v. Chakrabarty*) and administrative rulings (e.g., *Ex Parte Hibberd* and *Ex Parte Allen*) in the US opened the door to the patent protection of the products of biotechnology—in these cases, microorganisms, plants, and multicellular animals, respectively.

It is easy to forget the level of excitement and anticipation that accompanied phenomena such as these. Facilitated by the new biotechnologies and a favorable legal environment, biodiversity, it seemed, was acquiring potential new commercial uses and potential—perhaps extraordinary—economic value.

In its opening paragraphs, the CBD signed in Rio reaffirms national sovereignty over biological diversity. Access, it is agreed, will be granted on the basis of “prior informed consent” and “mutually agreed terms” with the country offering the material. Legally, sovereign countries could have demanded such conditions without resorting to an international treaty. They could, to be blunt, have been selling access to biodiversity all along. The Convention, however, was anticipating a market and laying the ideological basis for commercial transactions. It both reflected and encouraged existing expectations that there would soon be a substantial market for biodiversity, the benefits from which would flow to developing countries. Since the Rio meeting, the assumption of many has been that national sovereignty would (and, some would argue incorrectly, could) only be exercised in the form of bilateral agreements tying access to benefit sharing. Months before the Convention even came into effect, books were already appearing on the subject of “biodiversity prospecting”. (Reid et al. 1993) In this and many other similar works, the famous Costa Rican Merck-INBio bioprospecting contract was highlighted—a contract inked the year before the Rio Earth Summit.

The Convention’s treatment of genetic resources of agricultural relevance warrants particular mention in this study. Article 15 of the Convention states: “For the purpose of this Convention, 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 have acquired the genetic resources in accordance with this Convention.” In other words, only countries of origin can grant access.

The Convention defines “country of origin of genetic resources” as “the country which possesses those genetic resources in in-situ conditions.” Further, it says that “in-situ conditions means . . . in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.” In other words, the country of origin may be different than the source country.

The Convention with its provisions on access (prior informed consent and mutually agreed terms) applies to countries of origin, as opposed to source countries, when it comes to agricultural biodiversity. Determining which country is the country of origin, therefore, is more complicated than simply ascertaining where an accession—seeds or planting materials of a landrace, or farmer’s variety—came from. The Convention demands that one identify the country where the species, or the genetic resources (depending on one’s interpretation of the definition of “country of origin” in the CBD), “developed their distinctive properties.” Answers can seldom be provided with certitude, given the millennia that have passed since our Neolithic ancestors began the transition from hunting and gathering to agriculture. The geographical origins of the myriad distinctive properties found in PGRFA are largely shrouded in millennia of evolutionary history. No history can be written of the origins of each distinctive property in agricultural crops. The countless “distinctive

properties” in the gene pools of agricultural crops serve only to confuse matters further.

Establishing legal title to genetic resources, if achieved, would leave an additional problem unresolved. Seeds and planting materials have been spreading around the globe for thousands of years. They are widely dispersed both in farmers’ fields and in genebanks. A country may claim ownership, but it will not necessarily control the supply of the material—and there may be many suppliers! Thus, countries may not be able to exercise ownership effectively, despite the formula found in the Convention. It is understandable, perhaps, that some now question whether the approach outlined in the Convention toward genetic resources of cultivated and domesticated species is viable.

While the Convention’s subject matter encompasses all biodiversity, its drafters took pains to recognize “the need to seek solutions to outstanding matters concerning plant genetic resources within the Global System for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture, in particular (a) access to ex-situ collections not acquired in accordance with this Convention; and (b) the question of farmers’ rights” (UNEP 1992a).

In other words, the CBD cedes to FAO the negotiation over how those agricultural genetic resources assembled over the last forty years and stored today in genebanks will be handled, together with the very different legal and equity concerns represented in the highly politicized term “Farmers’ Rights.”

The link between the two fora, CBD and FAO, is historically rooted and situated. It is manifested in the text already quoted (Resolution 3 of the Nairobi Final Act of the Conference for the Adoption of the Agreed Text of the CBD) and in the stated objective of the FAO negotiations—to bring the FAO International Undertaking into harmony with the Convention. More to the point, however, this connection is rooted in some of the inherent difficulties agro-biodiversity poses to policy makers trying to construct systems for its ownership and control. Had the Convention come up with a solution or formula for this complex set of problems, delegates would not have recognized the existence of “outstanding matters” regarding PGRFA. They would simply have applied the CBD’s formula. Having created more expectations than solutions, the CBD left the difficult work for FAO.

It is not clear today how those expectations will be met or how solutions can be found “in harmony with” the CBD’s language and definitions.

As this report is being written, the Conference of Parties to the CBD has negotiated a legally binding protocol on biosafety. The regulation of international movement of living modified organisms (LMOs) through such a protocol under the CBD may run into conflict with efforts being undertaken through the WTO to open up trade in such materials more fully.

II. Review of Current and Outstanding Issues

The international debate on plant genetic resources centers on a number of complex, interrelated topics, including

- ✂✂access to genetic resources;
- ✂✂benefit sharing associated both with access to the resources and with their ultimate use;
- ✂✂intellectual property rights;
- ✂✂farmers' rights; and
- ✂✂conservation and use of genetic resources.

Access to Genetic Resources

Plant breeders work with plant genetic resources to fashion new varieties. Typically, they work with existing cultivars and other materials, which they keep in their own private or institutional "working collection." An individual plant breeder may require materials from a major genebank collection only sporadically. Nevertheless, the need for such collections is ongoing, and in cases where a breeding program requires rare materials, the ability to access collections held in other countries can become critical. In the period between 1992 and 1994, the eleven centers of the CGIAR holding ex-situ collections of plant genetic resources distributed more than 400,000 individual samples, most to users outside the host country of the particular center (Systemwide Program on Genetic Resources 1998).

More than 6 million accessions of plant genetic resources for food and agriculture are now held in ex-situ collections worldwide. A large but unquantifiable amount of material still exists in situ. Most of the material stored in ex-situ conditions was collected prior to the coming into force of the CBD, and will not be covered by the terms of that Convention unless governments decide to apply those terms retroactively. In most cases, institutes have treated this material as though it were in the public domain and have made it easily available to all bona fide users. Despite the current controversies, most institutes still do regard the material as being a "common heritage" and they still distribute it more or less freely. The CGIAR has agreements with FAO recognizing that CGIAR-designated germplasm is held "in trust" for the international community. In excess of 500,000 accessions have been so designated, a substantial percentage of the unique (and well-documented) germplasm in ex-situ storage.

In the current debates, "access" is firmly linked with "benefit sharing," though few would seriously argue that existing "international" collections will be returned to individual countries or will somehow be removed from the public domain. Nevertheless, the provision of access to materials provides a point at which the relationship between providers and users of genetic resources can be subjected to certain rules; that is, it can be regulated.

If decision-making is left to each individual country, countries can choose to allow or restrict access to the materials they have. They can determine, or at least negotiate, the terms of access. They can also choose to deny access altogether. Countries desiring this level of autonomy and control need not participate in international negotiations on the subject; as sovereign states, they already have the authority to establish such a policy. The current negotiations are about whether, and to what degree, there will be an internationally agreed regime, or set of rules,

governing access. In practical terms, to what extent will there be a multilateral system, and/or to what extent will access arrangements be handled bilaterally?

One of the first questions countries will have to address hinges upon the scope of the agreement. To what, exactly, is access being granted?

Does it involve materials acquired both before and after the coming into force of the CBD (29 December 1993)? Is it access to all crops or to a specified list of crops? If so, which crops? Indeed, how is the term “crop” defined operationally—as a gene pool or as certain identified species?

Furthermore, is access to be granted to genes? Gene complexes? Wild relatives? Landraces? Cultivars? Derivatives? Breeding lines?

Or will access to some of these categories come with restrictions, and if so, what restrictions? Will access be granted for research? Conservation? Breeding? (Simple selections? Crossing?) For any use? For direct commercialization without subsequent improvement? For agriculture only? For medicinal or industrial purposes?

What forms of intellectual property rights, if any, might a recipient of germplasm seek or obtain involving material covered by the international agreement? How broad a scope of activities and materials will intellectual property rights need to cover in order to encourage (or at least not discourage) research and development by the private sector?

Of all the options available, the most discussed at FAO is that of establishing a system of open or facilitated access to a core group of crops (named but not yet defined in terms precise enough to operationalize). Countries have not yet addressed the important, but sticky, question of whether access will be limited to those countries signing the final agreement—to those “joining the club.”

A system making certain materials available openly to all, or to “club members,” is one based on the premise that there is some form of common responsibility for the materials. Property that is not privately owned must be publicly maintained. What, then, are the responsibilities of parties to an agreement toward the genetic resources administered under that agreement?

An additional and even more difficult question arises. Assuming that some countries, or groups of countries, have contributed more than others to the collections, and assuming that some countries have the capacity to benefit more than others from access to the collections—what form and level of benefit sharing will be agreed upon in exchange for the not insubstantial benefit of being able to have access to these international collections? In other words, will developing countries (from which much of the material was originally gathered) receive some benefit from developed countries (which have made extensive use of the material and continue to exploit it effectively)?

Benefit Sharing

Two fundamentally different positions, each with many nuances and versions, exist among countries toward the CBD’s objective of promoting “the fair and

equitable sharing of the benefits arising out of the utilization of genetic resources" (UNEP 1992b).

One sees biological diversity as a potential commodity and benefit sharing as a type of payment or compensation for this commodity. Benefit sharing is thus achieved through a fee-for-access mechanism agreed upon between supplier and customer.

As discussed earlier, the peculiarities of agro-biodiversity mitigate against the "commoditization" of biological diversity. The marketplace value is neither easy to establish nor easy to realize. This is the case even after genetic resources have been used in a plant breeding program. And it is doubly so before their usefulness has been established in such a program. Moreover, establishing clear title to agricultural biodiversity may be highly problematic if the CBD's definition of "country of origin" is used.

Even if the country of origin were determined, establishing the value of any particular genetic contribution to a breeding program would be nearly impossible, rendering negotiation of the terms of access laborious at best. Consider the case of the VEERY wheat line developed at CIMMYT. More than 3,100 crosses were made among 51 parents from material acquired from 26 countries (B. Skovmand, personal communication, 1997). Determining the value of each accession and negotiating with dozens of countries for the rights to use material in a breeding program would be enough to dissuade most breeders. And if the VEERY line, with its complicated pedigree, were used as a parent in another breeding program, confusion would certainly reign. No accepted qualitatively or quantitatively based formula exists for placing a monetary value on the genetic contribution of individual accessions to a breeding effort.

The technical complications of operationalizing a fee-for-access regime are not insurmountable in cases where the genetic resources at stake are rare and geographically isolated, such as with many wild species of pharmaceutical interest. Hundreds, perhaps thousands, of bioprospecting and access-related contracts now exist in this area. If similar agreements covering access and benefit sharing exist in the field of agro-biodiversity, they are certainly not numerous.

The difficulties of determining ownership, and the inability of countries historically to establish a viable market for genetic resources, have led some countries to consider a second, different strategy: a broader, multilateral approach to benefit sharing, which could avoid the problems of linking benefits or compensation to specific transactions for specific genetic resources. As with bilateral, transaction-based proposals, this alternative can take on many forms.

Countries may choose to acknowledge that compensation or benefit sharing must be organized and carried out multilaterally in deference to the technical difficulties of establishing markets or prices for genetic resources, while still recognizing the undisputed worth and importance of the resources and of access to them.

A multilateral approach will surely require a common agreement on the nature of the benefits to be generated or shared, the quantity or level of benefits required, and the mechanisms and criteria for realizing and/or distributing those benefits.

One proposal is to establish an international fund, contributions to which might be voluntary, compulsory, or a combination of the two. This fund might disburse money to governments based on a certain formula, for those governments to use as they deem appropriate. Arriving at an agreed formula will not be easy. It is not obvious that the formula can be based on the quantity of genetic resources provided to the system, because quantity is not a surrogate for value. Moreover, scientific measurements of value do not exist. Even estimates are virtually impossible to make when the accessions have not been characterized or evaluated, as is the case with a large number in existing collections (FAO 1996b). Previously accepted formulae—such as those used for determining UN dues—might be employed to calculate obligations to the fund and even shares of benefits to be disbursed from the fund. Gross domestic product and other economic measures, however, do not necessarily correlate with how much a country is benefiting from access to genetic resources, nor with how much a country needs (for whatever purpose) or deserves (in terms of its contributions of genetic resources to the system).

Despite the difficulties, a multilateral system will have to contain a formula or some kind of agreement spelling out the countries' obligations to the system—to a fund, perhaps—in sufficient detail for the mechanism to be put into operation. It is conceivable that those obligations might be met through financial or in-kind contributions or both. An agreement might also include incentives for compliance, and/or sanctions for noncompliance, to encourage responsible behavior and to ensure that countries benefiting from the system (either as recipients of genetic resources or as recipients of funds) meet their agreed obligations.

A fund might also be established for a specified purpose; in this case, presumably, it would be for conserving and developing plant genetic resources for food and agriculture. If so, it would be logical to turn to the FAO Global Plan of Action, adopted by 150 countries in Leipzig in 1996, to provide the framework for activities to be supported through a fund. This plan covers the areas of both conservation and utilization and contains a substantial national capacity-building aspect. Countries wanting a multilateral approach with a benefit-sharing component that is related to genetic resources may be attracted to integrating the Global Plan of Action into the more comprehensive agreement on genetic resources. However, the costing of the plan, done by the FAO Secretariat that prepared it, was never accepted by the conference that adopted the plan itself. This indicates that the question of how much funding will be made available—and thus, indirectly, of how much of a benefit the Global Plan will be able to provide—remains a point of controversy. Further, the plan contains no mechanism or formula for apportioning funds. It simply addresses needs associated directly with PGRFA. Depending on one's viewpoint, this may be an advantage or a disadvantage.

Direct linkage of a benefit-sharing mechanism to plant genetic resources themselves underscores the fact that benefits must be generated before they can be shared. This applies equally to developed and developing countries. Thus, assistance in the generation of benefits from plant genetic resources may be an effective means of addressing equity concerns in an agreement that pairs access and benefit sharing. Financial donors are likely to want assurances that "contributions" will be used for certain purposes. Recipients may be willing to accept the linkage to PGRFA, but

some, undoubtedly, will argue that they should be allowed to use the funds for whatever purposes they deem appropriate. The funds, in their view, are not a demonstration of charity but the manifestation of an obligation—an obligation not to the genetic resources but to the countries that have provided them.

In summary, benefit sharing may

- ▬ be seen as compensation or as a tool to accomplish particular objectives;
- ▬ be organized bilaterally or multilaterally (or as a combination of the two, based on what the scope of the agreement is);
- ▬ be tied or unrelated to specific transactions for particular genetic resources;
- ▬ be voluntary or compulsory;
- ▬ come in the form of cash or in-kind benefits; and may
- ▬ be used, or not, to support work with genetic resources.

Almost any form of organized, multilateral system of benefit sharing will require at least a minimal amount of administration. A secretariat would be needed to monitor and report on the implementation of the agreement. It might also have certain fiduciary or, in the case of a link with the Global Plan, programmatic responsibilities. This raises the question of how such an agreement, system, and secretariat would relate to countries and their national programs, to FAO, to the CBD, and to other institutions such as the International Plant Genetic Resources Institute (IPGRI) and other centers of the CGIAR.

Intellectual Property Rights

Intellectual Property Rights (IPRs) come in a number of forms, among these patents, trademarks, copyrights, plant breeders' (variety protection) rights, and trade secrets. They may be organized or regulated through an international regime such as a convention. They may be specific to a country. Depending on the country and its national legislation, some or most of these forms can be applied to plant genetic resources. In general, the US offers the most opportunities for protection—in terms of both the form of protection and the categories of materials that can be protected. The European Union is somewhat less accommodating, and developing countries generally offer the fewest possibilities for IPR protection. This, however, may be changing.

In the Uruguay Round of negotiations held by the WTO, agreement was reached on what were termed "trade related aspects of intellectual property rights" (the TRIPS Agreement). Under the terms of this agreement, countries will be required to adopt patent and/or sui generis forms of IPRs for plant varieties (and perhaps for other categories of biological materials as well) if they wish to avoid trade sanctions.

Existing IPR regimes were designed principally for circumstances prevalent in developed countries. These regimes provide the legal means through which IPR holders can restrict others from multiplying or selling the object of the protection—a new crop variety, for example. This tool helps those who can use it establish and

maintain a position in the market, and thus helps them acquire a higher level of pecuniary benefits than might be expected were competition to be unfettered.

The UPOV system, as already noted, is aimed at the protection of varieties. In order to qualify for protection, a new variety must be distinct, uniform, and stable. Genetic material found in the varieties (unless protected through other forms of IPR) remains available for use by other breeders. Earlier acts of this convention (e.g., 1978) were based on the assumption that farmers could save, exchange, and to a limited degree sell seeds of protected varieties. The 1991 Act of the Convention—the only UPOV act now open for signing by new members—turns these actions into privileges and exceptions, which must be spelled out in national legislation if they are to continue to be permissible even to a limited degree. The UPOV system is both more permissive and less protective than typical utility patent systems. As such, it seems to be caught in the middle, targeted by NGOs on one side as restricting the historical practices of farmers while failing to recognize their contributions to modern varieties, and threatened on the other side by patent alternatives, which offer more extensive protection. The WTO TRIPS Agreement, however, may prove a boon to UPOV. Countries scrambling to meet the deadline for adoption of patent or *sui generis* systems for plant variety protection may find it convenient to reach for the shelf and pull down the UPOV model law. Rapid expansion of UPOV membership could alter the dynamics of power within the convention and create opportunities for reluctant, new members to challenge parts of the convention that they consider objectionable. It could also intensify views already enunciated by some developing countries in fora like FAO that UPOV does not serve their interests.

Existing IPR systems, such as that represented by UPOV, clearly cannot easily be used by farmers or others in developing countries to protect heterogeneous biological materials like landraces. Thus, in the context of an international debate over access and benefit sharing for genetic resources, it would appear that systems exist to facilitate rewards or benefit sharing associated only with certain types of biological materials and certain types of intellectual activity.

Developing countries typically lack property rights legislation that could be utilized to protect products of farmer (or community) selection and plant breeding. However, it is not clear that such protection possibilities, even if they were to exist, would provide substantial benefits to people availing themselves of these. Unless commercial markets exist for a product, IPR protection of the product is meaningless. Nevertheless, some countries are considering such forms of IPR, and they may provide certain benefits for a limited number of farmers and farming communities. If enacted on a wide scale in developing countries, such laws would almost certainly dampen the argument that Farmers' Rights be realized through measures agreed at the international level.

Countries aiming for consistent policies on this subject across international fora will need to consider at least two issues. First, should farmers and communities have the legal capacity to protect their materials and their intellectual contribution to these? If so, what would such legislation look like? How could it be implemented?

Second, to what extent are the demands of the TRIPS Agreement compatible with the objectives of the CBD: with the conservation, sustainable utilization, and fair and

equitable sharing of benefits arising from utilization of genetic resources? Will the TRIPs requirements affect biological diversity negatively? Will the agreement requiring countries to adopt IPR legislation also require provisions to ensure benefit sharing linked to the utilization of the resources?

The presence and rapid expansion of IPRs in relation to biological materials is one of the factors that charges the atmosphere in both the CBD and FAO negotiations. Until final agreement is reached at FAO on the matter of plant genetic resources, developing countries are likely to continue to perceive existing legal regimes as biased in favor of facilitating benefit flows only to formal systems of plant improvement. Moreover, developing countries will continue to believe that they are paying premiums for IPR-protected seed containing genetic materials they have donated, without compensation. If benefits cannot be generated for developing countries either through an IPR system or through a multilateral system for PGRFA, then restrictions on access to genetic resources may appear the most attractive option for developing countries.

An informal survey conducted by IUCN turned up thirty countries now considering legislation on access to genetic resources (Glowka 1998), including some of the countries richest in both biodiversity in general and agro-biodiversity in particular. If enacted, such legislation may complicate negotiations at the international level on the question of access. Countries may be faced with an international agreement running counter to national legislation, posing yet another bump on the road to consistent national policies.

Farmers' Rights

Ironically, the term "farmers' rights" was first used by the seed industry in hearings in the US Congress in the 1960s. The industry used the phrase to reassure Congress that the intellectual property rights system they were proposing for plant varieties would not overturn the farmers' rights to save, replant, and even resell seed of protected varieties. The industry was not concerned with competition from farmers who might replant or sell seed. The legislation was aimed at the "pirating" of proprietary seed by other companies (Fowler 1994).

This history had effectively been lost, in both commercial and diplomatic circles, when the term resurfaced in the debates at FAO in the early 1980s. In this second incarnation, Farmers' Rights were seen as a balance to Plant Breeders' Rights (PBR). Proponents argued that farmers, as a class, deserved recognition for their historic and ongoing conservation and improvement activities. Reward for individual farmers was never proposed, because it would have contradicted the view of Farmers' Rights advocates that the resources were a common heritage and that "credit" for their development could not properly be assigned to individuals, either in time or place. Revealingly, Farmers' Rights were neither described nor defined by proponents in legal terms. They were not conceived of as legal rights.

Farmers' Rights had unquestionable impact as a political slogan, but it was not a very accurate term to describe what its proponents really wanted. Negotiations at FAO settled on the following definition. Farmers' Rights, the countries agreed, were those rights "arising from the past, present and future contributions of farmers in

conserving, improving, and making available plant genetic resources, particularly those in the centers of origin-diversity." Describing the source of the rights, is not, however, the same as specifying what those rights are. That question was addressed most clearly in the Keystone Dialogues (1990), which brought together government representatives from developed and developing countries with NGOs, scientists, and the private sector. They concluded:

Farmers' Rights recognizes that farmers and rural communities have greatly contributed to the creation, conservation, exchange and knowledge of genetic and species utilization of genetic diversity, that this contribution is ongoing and not simply something of the past, and that this diversity is extremely valuable. Yet, neither the marketplace nor current intellectual property systems have any way of assigning a value to this material. A concrete way of recognizing Farmers' Rights would be a fund, such as the fund currently existing at FAO, which supports genetic conservation and utilization programs particularly, but not exclusively, in the Third World. The fund would not be designed to reward or compensate individual farmers, farm communities, Third World countries, or governments nor to compensate anyone or anything based strictly on their contributions of germplasm. (Keystone Center 1990)

Farmers' Rights have now been debated continuously for over a decade. In that time, the concept has mutated and evolved. The discussion is complicated—and confused—by the very different types of proposals and negotiating positions being put forward by governments. Depending on one's viewpoint, Farmers' Rights should be:

- ~~///~~ a simple, nonbinding statement of appreciation to farmers;
- ~~///~~ a term used to describe a range of internationally agreed commitments (voluntary or mandatory?) to farmers, manifested through support for better conservation and development of plant genetic resources;
- ~~///~~ a series of internationally agreed "entitlements" provided to farmers, manifested through programs, policies, laws, etc.;
- ~~///~~ an alternative or additional form of intellectual property rights to confirm ownership and to facilitate rewards to individual farmers, communities, or nations;
- ~~///~~ legal rights (and/or entitlements) to be determined and granted at the national and local level.

The Eighth Regular Session of the FAO Commission on Plant Genetic Resources for Food and Agriculture (April 1999) was able to break through the morass and agree on wording for an article on Farmers' Rights. The article recognizes the contributions that farmers have made historically to the conservation and development of PGRFA. It then goes on to state that "the responsibility for realizing Farmers' Rights, as they relate to Plant Genetic Resources for Food and Agriculture, rests with national governments." Parties to the agreement—if it is ever finalized—agree to protect and promote Farmers' Rights "in accordance with their needs and priorities" and subject

to each party's national legislation. The compromise embodied in the text legitimizes efforts of developing countries to recognize and give substance to Farmers' Rights nationally. Strictly speaking, it could be argued that they already had the right to do this. On the other hand, the article also effectively eliminates any tangible international obligations. The text does not specify tangible obligations of developed countries to developing countries and/or their farmers, for instance. The issue of how access and benefit sharing are linked and the question of what kind of reward or compensation might be offered for the contributions of farmers remain to be settled. The agreement on the Farmers' Rights article simply pushes this debate into the remaining articles of the International Undertaking.

While FAO delegates have, remarkably, been able to agree on text for the article on Farmers' Rights, it is unlikely that they have actually "solved" the problem. It is difficult to imagine that the text agreed upon contains a solution to the political and economic tensions, a solution that could satisfy all the various competing interests so long associated with the term "Farmers' Rights." Indeed, a number of NGOs and even some governments have signaled their intention to reopen and continue the struggle over various demands associated with the term.

To the extent that the debate over Farmers' Rights continues to impinge on the larger debate, it may be useful to separate the legal, policy, and programmatic elements of the Farmers' Rights debate and to determine how best, and where best, to address them, by group. Calls for land reform, under the banner of Farmers' Rights, and proposals for IPR systems for farmers are not easily considered by fora constituted to address plant genetic resources. On the other hand, delegation of some of these issues to other fora may further complicate the problems governments already have in developing and coordinating consistent, holistic policies in this area.

Conservation and Use of Genetic Resources

No country has the luxury of conserving genetic resources without reference to use. Properly managed, genetic resources are renewable. Unlike for some natural resources such as oil, use of genetic resources does not necessarily result in their depletion. In fact, it is use that dictates that genetic resources be conserved, and it is use that provides the rationale for government expenditures for collecting, for ex-situ and in-situ conservation, characterization, evaluation, and all the other elements comprising comprehensive PGRFA programs.

Uncoupled from use, conservation programs lose their main *raison d'être*, and in most cases it is only a matter of time before funding support begins to wither. It is not difficult to understand that policy debates on access, benefit sharing, IPRs, and Farmer's Rights might directly affect the use of genetic resources. It should be equally obvious that they can also have a profound influence on the conservation of those resources. Since utilization without conservation is impossible, and conservation without utilization is largely meaningless, delegates to international negotiations must take care that their deliberations not merely result in a favorable economic outcome for their country but that they also contribute to building a workable global system for PGRFA, a system which ensures the conservation of PGRFA and promotes its development. Understandably, few individual delegates to CBD, FAO, or WTO

meetings come with ample experience and expertise to consider all of these topics and their complex interactions. Cooperation between ministries is required, both to have a consistent policy across intergovernmental fora and to have a competent and intelligent policy.

Today, governments depend upon one another to conserve PGRFA. No one government has a complete collection of the PGRFA of interest and importance to its citizens. The maintenance of certain major or base collections (particularly those which are in international institutes or are part of a future multilateral system) should arguably be an international responsibility and not the responsibility or obligation of a single country or institution.

The FAO's first *Report on the State of the World's Plant Genetic Resources for Food and Agriculture* revealed that there are major weaknesses and gaps in current conservation and utilization efforts. But it also revealed substantial capacity and potential (FAO 1996b).

If a rational and secure system of ex-situ conservation is to emerge from the current efforts of 180 governments, 1,300 genebanks, and countless private and NGO efforts, then a certain amount of priority setting and coordination will need to take place among governments.

Based on the understanding that the international community has real, if unspecified, responsibilities toward the conservation and utilization of PGRFA, FAO undertook a country-driven process to develop a Global Plan of Action (FAO 1996a). Global plans, after all, make little sense if countries deny common concerns and responsibilities.

Twelve regional meetings were held, and 159 country reports were prepared by governments to serve as input into the *Report on the State of the World's Plant Genetic Resources* and the Global Plan of Action. The preparatory process was the largest such process to date, and the plan was the first ever adopted officially by governments.

While governments have agreed to a plan, they have not, to date, agreed on the precise nature of their responsibilities or obligations to that plan. Questions of monitoring, oversight, facilitation, and funding remain to be answered.

It is difficult to imagine that governments will answer these questions and commit themselves to a plan for conserving and utilizing PGRFA except within the context of a larger agreement on access, benefit sharing, etc. On what basis and for what reasons would countries accept obligations to assist one another with conservation if access and benefit sharing were left to the whims and discretion of individual governments? As we have already stressed, progress cannot easily be made in any area, including conservation, out of the context of progress in developing a coherent global system addressing the full range of PGRFA issues, including access, utilization, benefit sharing, and property rights.

The task facing governments is to build a rational, efficient, just, and sustainable system for conserving, exchanging, developing, and sharing the benefits of plant genetic resources. Approached in a piecemeal fashion, all efforts will surely fail, as

each part is interwoven with all the others. Systems, however, do not function “on paper.” They work through the actions of people and institutions. In addition to learning how to plan, and how to agree, governments must learn how to generate trust. No system of access and benefit sharing will work well without it.

The various intergovernmental negotiations on biodiversity now under way are opportunities for building trust and confidence. Whether governments seize those opportunities will in large part determine whether enough commitment and goodwill is generated to honor the pledges that are made in future agreements. In this business, diplomatic victories do not necessarily provide solutions to practical problems. Agreements are not necessarily implemented. Ironically, victory can be the first step toward defeat.

In the main body of this study, we summarize the findings in, and the lessons learned from, eight case studies of how governments are formulating and enunciating their policies on plant genetic resources for food and agriculture.

Chapter 2

Decision Making at the National Level

To explore how policies are formulated at the national level, the positions taken by the appropriate government representatives in the various international fora are interpreted as the outcome of the national policy debate. How is this outcome influenced by the various views expressed at the national level by the all the actors involved? Answering that question requires asking several others: Who are the actors involved in the policy process? What interests and/or concerns do they express or defend? How do all these actors interact in the policy process?³

Insights gained in addressing those matters should in turn help answer the following questions: Can we understand why there are so many inconsistencies among the positions taken by representatives of the same government in different fora? Do the differing concerns explain differences among countries within the same forum? Does this analysis provide us with clues as to the possible evolution of the international debate?

Case studies were conducted in Brazil, France, Germany, India, Kenya, the Philippines, Sweden, and to a lesser extent the US. This sample of countries cannot be seen as representative in any fashion; indeed, statistical representativity in this matter would not be very meaningful. Rather, the sample was selected to cover a wide range of national situations. In that the study relied on voluntary contributions by agencies and individual experts, many cases were picked because an opportunity was available. In spite of these limitations, the range of national situations analyzed here provides interesting insights for understanding the current international stalemate.

As it turned out, the internal processes revealed by these case studies are viewed by some of the authors of the case studies themselves as too sensitive to be publishable, suggesting that the reports do capture essential elements of the decision process at the national level. This chapter is intended to summarize the lessons learned and to present them in as objective a manner as possible, in hope that the material will be perceived as a fair description of the current situation.

In each country a well-informed and usually quite senior investigator was asked to interview participants well placed in the national policy process and, as a result, well informed on that process. Most of those interviewed replied cordially, with the understanding that their judgments and personal opinions, which were eagerly sought by the investigators, would be kept confidential. The sample of people to be interviewed was purposively selected, starting with actors whom the investigators knew were involved. Then new persons were added on the basis of

³ Surprisingly, in some instances national positions may come about through no process at all. They may simply reflect the individual views of the country's representative—views which effectively become "government policy" when enunciated by the representative in the course of an international negotiation. This is an extreme case where the multiple-actor "game" of our framework is reduced to a single actor.

recommendations made by the first interviewees. The policy process being essentially one of interaction among actors, the actors are themselves the best source of information on who the other actors are.

Reading of appropriate documents and the authors' familiarity with the policy process supplemented the interviews. In some cases, the authors of national case studies did not follow the protocol strictly, resulting in the information available not being complete. Yet the framework of analysis seems to be robust enough to allow useful inferences from incomplete data.

I. Analytical Framework

Following a "political economy" approach, national decisions or positions at international fora are interpreted as the result of an interaction process among policy actors; that is, among relevant government agencies and interested stakeholders who have somehow been able to acquire a voice in the national policy debate. Each actor is assumed to pursue specific objectives within a specific context, which includes a set of constraints resulting from its own identity and nature as well as from the countervailing influence exerted by other actors having different objectives. Note that these assumptions on the behavior of individual actors apply equally to government agencies, to industry associations, and to organizations of civil society. It is indeed common knowledge that various ministries of the same government take different positions on the same issues, reflecting the differences in their roles and interests. The interaction process varies from country to country depending on institutional arrangements, forms of government, history, culture, established patterns of behavior, etc. Existing coordination mechanisms among government agencies to ensure a minimum degree of coherence vis-à-vis other actors, domestic and foreign, are an integral part of the interaction process discussed here.

When possible, the most revealing, and usually quite recent, national debate was identified and studied. For instance in India, specific attention was given to the preparation in 1997 and 1998 of two acts: the Plant Variety Protection and Farmers' Rights Act and the National Biodiversity Act. These debates at the national level revealed both which actors have been active and the roles that they have played, providing us with insights for understanding why particular government delegations take specific positions in various international fora.

Given the issues identified in the previous chapter, each national case studied was meant to cover the policies for the conservation and use of genetic resources as well as for benefit sharing. For the former, the main questions addressed are: What are the determinants of the corresponding national policies and practices? How strong is the national consensus underpinning these policies and practices? For benefit sharing, are breeders' rights enforced? By what means? Are these controversial? Are there procedures to recognize the contributions of the biotechnology industry, through patents, for instance? Are there procedures to arbitrate among those various rights? Finally, how are national positions in international fora determined by the national debate on the corresponding issues at the national level? Regarding international access to genetic resources and funding of

international collaboration for conservation and use, are there clear national positions and how can this be explained?

II. The National Cases Studied

We now attempt to answer the foregoing questions on genetic resources policies and practices at the national level for each case studied.

Brazil

For Brazil, our information on the actors and the domestic debates is sketchy. Yet it is clear that Brazil has an extensive and sophisticated set of practices and institutions devoted to the conservation and use of genetic resources. This is not surprising, given the wealth of its natural and human resources in this field.⁴

Recent developments in the area of IPR legislation, especially involving the way biotechnological inventions and new plant varieties are legally protected, indirectly reveal the nature of the national debate and the variety of concerns, probably expressed by a significant number of active stakeholders, that had to be taken into account. The Brazilian Congress passed a new patent law in May 1996, to bring Brazilian patent legislation into line with the GATT/TRIPs treaty.⁵ The congress also passed a Plant Variety Protection Law in April 1997, which stresses the granting of Plant Variety Protection Certificates as well as the right of small rural producers to multiply seeds. The main points for our purposes are that the Brazilian IPR legislation establishes a limit for the extension of patents to living organisms and that plant varieties can be protected but only by means of a UPOV-like regime.

Anecdotal evidence in the Brazilian case indicates several specific features, which may explain the stance taken by Brazilian representatives in international negotiations. Obviously, the country is very rich in terms of natural genetic resources and well-trained human scientific resources. Many institutions are involved in the preparation of national positions, including high-level decision-making bodies (e.g., the Senate, the Chamber of Deputies, the Presidency). There is even an Interministerial Group for Intellectual Property, established around 1995, made up of ten ministries (including the one for Navy Affairs!). And outside observers often stress how well prepared the Brazilian delegations are and how well their positions are thought through and articulated.

⁴ Brazil is generally referred to as a megadiverse country, possessing the greatest biodiversity in the world. According to data provided by the NGO Conservation International, it is estimated to harbor around 55,000 plant species (22% of the world's total), 524 species of mammals (131 endemic), 517 of amphibians (294 endemic), 1,622 of birds (191 endemic), and 468 reptiles species (172 endemic), besides nearly 3,000 freshwater fish species and around 10 to 15 million insect species. It is also estimated that utilization of biodiversity components is responsible for around 47.7% of the Brazilian GNP, distributed as follows: agribusiness (40%), forestry (4%), tourism (2.7%) and fisheries (1%).

⁵ According to the new law, "all or part of natural living beings and biological materials found in nature or isolated therefrom, including the genome or the germplasm of any natural living being, and any natural biological processes" are not considered inventions. Similarly, "living beings, in whole or in part, except for transgenic microorganisms meeting the three requirements of patentability—novelty, inventive step and industrial application" are not patentable. Patents may be granted, however, in the case of transgenic materials.

Thus it is clear that the importance of genetic resources to the long-term welfare of the country is widely perceived by all actors involved in the policy-making process. Given the nature and the wealth of its biodiversity, one can understand why Brazil is mainly concerned with the prospective utilization of its resources for pharmaceutical purposes, for which bilateral arrangements are probably appropriate. Brazilian delegates to the Commission on PGRFA, however, fully understand the value of a multilateral arrangement in the case of genetic resources for agriculture, in which the country is not particularly rich; it is dependent on foreign sources of germplasm for improvement of most of its major crops. The list approach (i.e., reaching an international agreement on a list of a limited number of species to be covered by a multilateral agreement) is appealing to them in this context, as it clearly limits the access regime to agricultural species, leaving Brazil free to exercise its sovereignty over its more impressive nonagricultural biodiversity. Focusing the international negotiation on which germplasm is to be covered by such a list is attractive as a way to separate the two domains (bilateral/multilateral) and perhaps also as a tactical lever to obtain concessions on the content of the multilateral agreement that remains to be negotiated.

France

In France, the debates on the formulation of a national strategy for agricultural genetic resources conservation and use revealed and promoted a strong convergence of views and interests between the scientific community concerned and the long-established seed industry. That debate took place at the same time as discussions on the mandate and role of the Bureau for Genetic Resources, an autonomous institution created by several major research institutes to coordinate their genetic resources policies and activities under the sponsorship of the various ministries concerned. It is interesting to note that the biotechnology industry and the NGO community have played only minor roles in the French policy debate.

The national strategy can perhaps be best characterized as the pursuit of a common interest, in terms of conservation of genetic resources, without incurring the costs of large public genebanks. Each actor maintains at its own cost the genetic resources it deems necessary for the pursuit of its own interest, accepting the sharing of these resources with other national partners and being confident that it can have access to the resources maintained by others. A lively debate is ongoing, however, regarding the definition of public goods and ways to ensure that they are produced. These include the funding of research on the most effective ways to conserve genetic resources and the definition of national collections; that is, resources of national interest. Some think that it might indeed be legitimate to subsidize the conservation of these resources in national collections, the difficulty being to avoid the free-rider problem inherent in any collective action. Note that France's decentralized "network" approach means that French institutions ultimately depend on non-French institutions for the long-term conservation of PGRFA. Moreover, French institutions must frequently resort to non-French members of networks for access to materials of current interest.

In this context, it is not surprising that most attention has been given to the protection of breeders' rights. France was indeed a founding member of UPOV. Not

much attention has been given to Farmers' Rights, other than the recognition that farmers can use their own seeds—within the realm, however, of European rules on the protection of plant varieties. And the granting of patents to biotechnology firms has not been controversial.

These domestic developments explain why the French delegation in the FAO Commission has been eager to maintain the freest possible forms of access to genetic resources and has been prone to emphasize the mutual benefits to be derived from a set of coordinated activities, undertaken and funded by individual actors pursuing their own interests and guaranteeing one another unrestricted access to the resources they conserve. At the international level, this leads to emphasizing free access to genetic resources and jointly agreed plans of action, to be implemented by each country and funded by the resources the country can mobilize. This "collaboration slant" is of course consistent with the interest of a country that has not made a significant or long-term commitment to a centralized PGRFA collection or associated institution. Cooperation based on free exchange of PGRFA is not simply a political nicety; it is a practical necessity. The cooperation slant is also consistent with an emphasis on first reaching a consensus on a common position within the European Union and then defending it in broader international fora.

In view of this, the French delegation in the FAO Commission, while it strongly supports the Global Plan of Action, does not see the creation of a new international fund as critical to the key objective, namely the implementation of a commonly agreed plan of action. But on the other hand, if a new instrument can help mobilize the necessary resources to fund the implementation of the plan of action, French delegates would not really object. Given their place in the government apparatus, however, they are not in a position to make a financial commitment on the part of their government and perhaps not even to initiate the process that could lead to such a commitment.

The absence of the biotechnology industry in the domestic debates on genetic resources may explain its absence at the international level also. The comparison with the US situation in this respect is striking. One reason for the difference may be the controversial nature of the policy debate in France regarding genetically modified organisms (GMOs). Thus it may be that the biotechnology industry has other priorities in its efforts to influence public policies and that it prefers not to get embroiled in issues potentially leading to tensions with developing-country representatives, further damaging its public image as profit seeking, oblivious to the needs of the poor, and thus exposing the industry still more to criticisms by NGOs. It may also be that biotech representatives feel the threat to free access to genetic resources is too remote to bother them.

Germany

In Germany, in the absence of direct information on the policy process, two processes indirectly reveal the cast of characters involved in the national policy debate and their relative influences: the preparation of the international conference held in Leipzig in 1996, the FAO International Technical Conference on Plant Genetic Resources; and the revision, also in 1996, of the Plant Variety Protection

(PVP) Act of 1985, followed by the establishment in 1997 of a fee for the reuse of farm-saved seeds. In Leipzig, Germany hosted 150 countries and numerous international and nongovernmental organizations for a week-long conference at which delegates considered FAO's first *Report on the State of the World's Plant Genetic Resources for Food and Agriculture* and adopted the Global Plan of Action.

The revision of the PVP Act was a domestic process designed to bring German legislation in line with UPOV 1991. Although these two processes were taking place at the same time, the relationships between the two appear surprisingly weak. One gets the impression that preparation for the Leipzig conference was dominated by the concern to be a good host and an "agreement facilitator"; and that it gave those pursuing an international agenda—that is, the cluster of actors working with the Cooperation Ministry—an opportunity to take part in the domestic debate on genetic resources. The main practical consequences of this opening may have been a somewhat greater emphasis on the conservation of genetic resources and greater visibility for the Information Center on Genetic Resources.

These processes confirmed the extreme fragmentation of the institutions and actors involved in the national debate. This, however, is not specific to genetic resources issues; it probably results from the federal nature of the republic and the high degree of decentralization of power and authority in the country. Hence it should not be surprising that the national position on these issues does not appear forceful. This may also reflect the fact that NGOs do not seem to be very active in the debate; they obviously believe, rightly or wrongly, that the topic is not of great importance. Given these attitudes, one can easily understand that the volume of financial resources devoted to domestic conservation efforts has been declining; and such a decline gives little impetus for an active involvement in international negotiations on genetic resources issues.

On the domestic front, the establishment of a fee levied on farmers using their own seeds is itself an unusual development. It can only be interpreted as the result of a decline in the power of farm organizations vis-à-vis commercial seed producers, though this judgment on the shift is admittedly speculative. Dominated by farmers convinced that new seeds are critical to continuing technical progress in agriculture, the major farm organization may have given little weight to the concerns of those active in traditional genetic resources management practices, who are viewed as marginal. If this interpretation is correct, one should not expect the German delegation in international fora to be very active or effective in defense of traditional Farmers' Rights.

India

In India, the preparation of the two acts mentioned (the Plant Variety Protection and Farmers' Rights Act and the National Biodiversity Act) as well as interviews with key actor representatives revealed a strong national consensus on the need to protect

India's national interest, perceived as maximizing the economic returns the country can derive from its rich biodiversity.⁶

India sustains a major national effort of conservation and utilization of genetic resources, spearheaded by the sophisticated National Bureau of Plant Genetic Resources (NBPGR) and many large All-India Coordinated Programs of crop improvement, conducted under the aegis of the Indian Council of Agricultural Research. India's genebank, recently expanded with a major grant from USAID, is now one of the largest in the world. It is aggressively seeking genetic materials from other genebanks around the world in order to build up its own collection.

Much emphasis is also placed on the fair sharing of these benefits within the nation. The title of the first proposed act, stressing the rights of both breeders and farmers, is revealing in this respect. In this context pressures from outside are resented. For instance, the recent adoption (in early 1998) by WTO of a report of its "Dispute Settlement Body" in favor of a complaint filed by the US government, arguing that India had failed to adjust its patent law in accordance with the TRIPs provisions of the Marrakech agreement, is seen by many as unfair and, if applied to products incorporating genetic resources, as contradicting the principle asserted in the CBD of national sovereignty over genetic resources.

Beyond this broad national consensus, differences exist on how best to pursue the national interest, on what would be a fair sharing of benefits, and also on the relative weight of the various actors in formulating a national position. Critics of the government would argue that insufficient resources are invested in documenting the wealth of biodiversity in order to make better use of it, and also in order to be better equipped to protect Indian interests in courts, both within the country and abroad. For instance, the granting of a US patent to a Texas firm for a rice variety incorporating much Basmati germplasm material was seen in India in 1998 as unfair but very costly to challenge in the US judicial system, and thus as requiring a special resource mobilization effort. Another controversial point involves the relative weights of actors, the bone of contention being the place given to NGOs and other representatives of civil society in the formulation of government positions.

As a result, Indian delegations in international negotiations tend to stress national sovereignty over genetic resources and the importance of Farmers' Rights. On the latter, the Indian position in international fora is directly influenced by their domestic debate. The debate within India having led to a broad consensus that rewarding farmers and local communities on an individual basis for their contributions would be absolutely impractical under most circumstances, Indian government representatives

⁶ The Indian gene center is among the twelve megadiversity regions of the world. About 25 major and minor crop plant species were domesticated here. The region is known to have more than 18,000 species of higher plants, including 160 major and minor crop species and 325 of their wild relatives. Around 1,000 wild edible species are known to be widely exploited by native tribes, a tally including 145 species of roots and tubers, 521 of leafy vegetables/greens, 101 of buds and flowers, 647 of fruits, and 118 of seeds and nuts. In addition, nearly 9,500 plant species of ethnobotanical uses have been reported from the country, of which around 7,500 are for ethnomedical purposes and 3,900 are multipurpose/edible species (National Academy of Agricultural Sciences 1998).

usually support the idea of establishing an international fund, analogous to the two funds proposed in the two acts drafted at the national level, as already discussed.

Another major concern is to secure the international recognition of national contributions, both of natural resources originating in the country and of human efforts by farmer communities and by plant breeders. One can thus explain some hesitation as to which international forum should receive precedence. The CBD is a better place to pursue the implementation of measures assuring national sovereignty over natural genetic resources. WTO is the forum where TRIPs are discussed and will be reviewed. The FAO Commission is the place where the special features of agrobiodiversity receive attention. Thus it is not surprising that outside observers have noted some inconsistencies among statements made by Indian delegations in these various international fora.

In the FAO Commission, the Indian delegation, in which researchers and scientists have a strong voice, recognizes the value of maintaining a multilateral system assuring free access to genetic resources for plants and animals of interest to agriculture. But it also strongly supports the establishment of an international fund to finance activities of common interest, such as the Global Plan of Action agreed at the Leipzig Conference. Indian delegates are acutely aware of the benefits to be derived from international funding of activities that would contribute to the documentation of their genetic resources, a necessary condition for any international recognition of these resources and of Indian claims on them, wherever such claims may be made. Thus they are supportive of collaborative international efforts; at the same time, they want to keep complete control on what happens on their national territory. The "solution" reached on Farmers' Rights by the FAO Commission, therefore, is one India will probably be able to accept.

Kenya

In Kenya, analysis of the preparation of a national strategy and action plan on biodiversity to implement article 6 of the CBD revealed several features of the policy process on genetic resources: limited involvement of senior policy makers (at cabinet level, for instance), typical rivalries among government agencies, the very limited voice of NGOs and other representatives of civil society, and the major influence of the donor community. In this instance the rivalries among ministries were resolved by an Interministerial Committee on the Environment, which charged two consultants with the task of preparing the strategy. Not surprisingly, the result has been that few bodies in the country are committed to the national strategy.

In this context, it is worth noting recent progress in the public debate. Building on previous achievements of a limited number of NGOs concerned with wildlife and with issues of patenting life forms, of Farmers' Rights, and of illegal exploration and collections of genetic resources from the country, a national workshop on access to genetic resources was organized by a major international NGO. It has led to the establishment of a working group, including representatives of the government agencies concerned as well as of NGOs, to draft national legislation on genetic resources access and benefit sharing. It was followed by opening up to

knowledgeable NGO representatives of the national delegation to the fourth Conference of the Parties of the CBD.

The country's economy depends heavily on agriculture (one third of the gross domestic product (GDP) and 70% of the active population). Kenya is also rich in biodiversity.⁷ Thus it is not surprising that it has developed a significant agricultural research effort, with special emphasis on plant breeding. Yet the international debate on genetic resources for agriculture has not received much domestic attention until now. An attempt to identify the locus of genetic resources policy making in Kenya reveals that the country lacks clear or defined institutional arrangements for initiating and overseeing the implementation of genetic resources policies. Accordingly, rules for benefit sharing among the various stakeholders are murky.

As a consequence, Kenyan delegations in international negotiations cannot be expected to be as precise as some others in the formulation of a national position. The country has much fewer human scientific resources and the national debate on genetic resources policy issues has been much less active than in India, for instance. Hence one can understand why observers of the international fora have noticed that the Kenyan delegation has often followed the leadership of others. These leaders are assumed to represent interests similar to those of Kenya (in contrast, for instance, to those of OECD countries) and to be more knowledgeable about technical aspects of the discussions. Yet the recent opening of the national policy debate as described here suggests that the Kenyan delegation in international fora may take a more proactive stance than in the past, defending in particular the benefits Kenyans could derive from the use of genetic resources found in their national territory.

The Philippines

The national debate on genetic resources seems to have been remarkably active in the Philippines during the last ten years, as reflected first by the rich array of legislation passed, beginning with the Constitution adopted in 1986, which states that all Filipinos have a right to "a balanced and healthful ecology in accord with the rhythm and harmony of nature," Since 1992 various laws have been passed to create "Integrated Protected Areas" (1992), to regulate the seed industry (1992), to promote the development of high-value crops, to protect the rights of indigenous people (1997), and to modernize agriculture and fisheries (1997). All of these have had an impact on the management of genetic resources. In addition, several statutes and codes (for forestry, fisheries, and bioprospecting, and regulating the use of bioresources) were adopted during the same period. Finally the President's Executive Order No. 247, of May 18, 1995, should be mentioned since it was one of the first national laws to fulfill provisions of article 15 of the CBD. According to Filipino NGOs, however, it has been difficult so far for national authorities to enforce that legislation.

⁷ It is estimated that there are between 8,000 and 9,000 species of plants in the country. In addition, the country has unique species of wild animals, which are a major attraction for tourists, another mainstay of the economy.

The proliferation of consultative bodies, commissions, and committees is another indication of a lively debate with broad participation of many stakeholders. Even though our case study of the country did not produce a detailed account of the process leading to a specific policy decision, such as the adoption of a new statute, there is indeed ample evidence of a dynamic civil society with many domestic—often local—NGOs interacting on a day-to-day basis with public officials. Significantly, these NGOs are active in a wide array of both policy and “practical” conservation and development projects involving plant genetic resources.

Concerns expressed during the various debates were of course diverse. Yet, because Filipinos widely perceive that their country has a wealth of biodiversity but that these resources are under great threat, a strong national commitment to the protection of biodiversity was expressed by the adoption in 1997 of a National Biodiversity Strategy and Action Plan. But it is clear that the implementation of such a commitment must contend with other important policy thrusts of the government, which are also supported by a wide national consensus. These include trade liberalization to improve the competitiveness of the national economy, the push for devolution in order to widen the base of national governance, and the need to work within tight government budget constraints, which limit the financial resources available for conservation of genetic resources. One outcome of these conflicting pressures is a proposed law on protecting new plant varieties, using the *sui generis* approach through the institution of Plant Variety Protection Certificates.

Given these constraints and the existence of a lively and open domestic debate, representatives of the Philippines in international fora must balance diverse and sometimes conflicting concerns. Such is the case in the PGRFA Commission, where the following objectives are pursued: the need to protect and conserve national resources; emphasis on national sovereignty; protection of the rights of indigenous people; the need to strengthen institutions; and the search for additional funding. Led by the Department of Agriculture—which has long been aware of the benefits of hosting such an international center as the International Rice Research Institute (IRRI) and which has always been very supportive of IRRI—the Filipino delegation nevertheless fully understands the value of a multilateral system in the case of genetic resources for agriculture.

Sweden

Numerous governmental and nongovernmental organizations are involved in genetic resources issues within the country. They include the normal ministries within their respective areas of competence as well as several autonomous public agencies, such as the Swedish Board of Agriculture, National Plant Variety Board, Swedish Gene Technology Advisory Board, Swedish International Development Cooperation Agency (Sida), the Center for Biological Diversity and its Threatened Species Unit, and the Patent and Registration Agency. In addition, Sweden hosts the Nordic Genebank, a facility that serves the region (and provides considerable support to a similar effort in the African countries of the SADC).

In the private sector, two major Swedish plant breeding companies are internationally active in Europe and North America: Svalöf & Weibull AB (merged

with German BASF in late 1998) and Hillestyg AB (part of Novartis). Note that there is virtually no plant breeding done in the public sector any longer. Two major pharmaceutical companies are also present: Astra (merged with Zeneca in 1999) and Pharmacia and Upjohn (headquartered in London with major research and manufacturing facilities in Sweden). They are members of the Swedish Association of the Pharmaceutical Industry, which represents the Swedish industry in both national and international questions.

The Federation of Swedish Farmers has articulated clear viewpoints on genetic resources issues and has identified important agricultural policy issues (e.g., it is reluctant vis-à-vis GMOs). It has also initiated research programs into strategic sectors through the Swedish Farmers' Foundation for Agricultural Research. Numerous forestry companies operate in Sweden and several research institutes are active, including the Forestry Research Institute and bodies at the Swedish University of Agricultural Sciences and other universities.

In spite of this large number of actors, there is little discussion in the media regarding national food security and management of plant genetic resources in Sweden. The country recognizes plant breeders' rights and joined UPOV 1991 in 1997. Sweden does support the idea of a multilateral system for PGRFA, though limited attention is given to Farmers' Rights apart from selected crops in horticulture. Patents follow the European Patent Convention and are not controversial. But the recent adoption by the EU Parliament of a directive to protect biotechnological innovation and the increased concerns about GMOs have initiated a rather intense public debate on implications of new crop technologies and IPRs.

Early attention was given in Sweden to lack of coordination among positions taken at various international fora and to the need for a possible multilateral system for access and exchange of plant genetic resources for food and agriculture. The issue was raised in a study by Bengtsson and Thornström (1996), which was a wake-up call leading to the present study. The main questions raised in the case of Sweden were:

- how to reconcile and to operationalize, on a rational policy level, issues between international agreements;
- the lack of a coordinated and effective Swedish program for preservation and utilization of plant genetic resources;
- the lack of a conceptual framework for handling all genetic resources as indicated by the CBD;
- the lack of attention given to the need to broaden the genetic variation within Swedish agriculture and forestry (however, plant breeding companies estimate that they will only need access to additional plant genetic resources in the long run—in thirty to fifty years); and
- insufficient information provided by government to Swedish actors about CBD and their corresponding responsibilities.

But that assessment, initiated in the mid-1990s, revealed that plant breeding and seed companies were not interested in contributing financially to a future multilateral

agreement for access to and exchange of plant genetic resources. It also made clear the need for an analysis of the consequences for Swedish agricultural policy of CBD commitments made by the government and of the FAO Global Plan of Action concerning plant genetic resources. In particular, how can support for agriculture be modified in order to promote agro-biodiversity? How will reduced public subsidies to plant breeding that is not of commercial interest affect Swedish agriculture in, for example, the year 2010?

These questions are slowly receiving more and more attention; but for several years the debate on these issues has remained within a small set of government officials. One person, an especially energetic assistant undersecretary, has played an important role in international discussions, particularly in the FAO Commission for PGRFA.⁸ With a shift in personnel, Sweden's position has become more moderate and less forceful.

Often the Ministries of the Environment and Agriculture respectively have coordinated their efforts in FAO and CBD by using that same head of delegation. In their study, Bengtsson and Thornström (1996) questioned whether the coordination evident at the individual chief negotiator level was sufficient. They doubted that it produced a policy genuinely cutting across the ministries involved as a joint position well anchored politically. They also pointed out that Swedish involvement in WTO affairs appeared to be almost disconnected from the country's involvement in FAO Commission and CBD negotiations. WTO seemed to be looked upon as dealing only with trade (without implications for genetic resources and IPR in PGRFA and CBD).

However, the wake-up call was heeded when the US-EU negotiations on a Mutual Agreement on Investments (MAI) were initiated in 1997-98. Here government decided to take an across-the-board look at which other international commitments had already been made and might contribute to setting the scene for how Sweden could position itself regarding the MAI proposals. The result was that Sweden took a much lower profile in pushing MAI in order not to contradict positions taken on similar issues in other fora, and the government became more aware of the generic issue of coordination of its positions across international fora.

Another recent development is that in 1998 the Ministry of Agriculture (following a proposal in the Bengtsson and Thornström study) asked the Swedish Board of Agriculture to develop a national program for plant genetic resources. Presented to the ministry in early 1999, the program comprises an inventory of existing facilities for conservation and utilization of plant genetic resources, suggesting establishment of a national coordination unit housed under the Center for Biological Diversity. It is important to note, however, that the program is focused only on national activities. It essentially ignores links with the international fora dealing with genetic resources and intellectual property rights.

⁸ At the ministerial level (Ministry of Agriculture and of the Environment), policy making and monitoring are usually handled at the level of assistant undersecretary (*departementsråd*, in Swedish). This person is normally assisted by one or two civil servants who deal with day-to-day monitoring and also participate in the Swedish delegations to meetings of the fora concerned. These assisting civil servants now and then also consult with various stakeholders in Sweden (independent government agencies, NGOs, the scientific community, and occasionally with the private sector).

Thus, to summarize, the genetic resources policy process in Sweden is mainly considered as one dealing with agricultural and environmental issues, unrelated to WTO and other trade issues. National actors are many, but because of the internal dynamics in government services, few officials have a long-term familiarity with genetic resources processes in the various international and regional fora. The single exception—with one individual playing a key role but without much institutional control and ultimately with questionable support—has not been an effective remedy to this weakness. Although there is now an emerging awareness in government offices that genetic resources issues are less about seeds and rain forests than about geopolitics (i.e., these issues may involve a radically new relationship between the private and public sectors, and loss of influence by sovereign states because of the rising power of transnational corporations)—there are at present few institutional instruments to tackle genetic resources issues from a more holistic and geopolitical perspective.

United States

In the US, interviews with participants in the various government delegations to the FAO Commission and to the CBD on how they prepare for these international negotiations revealed a strong national consensus, in spite of fragmentation of the policy process among various clusters of actors interested in specific international fora, and in spite of the lack of evidence of effective coordination mechanisms across those fora.⁹ For agro-biodiversity, the main actors are the relevant government agencies and the scientific community, which has a seat in government circles through the Agricultural Research Service (ARS). The traditional seed industry does not seem to play a prominent role; an interview with a representative of the American Seed Trade Association indicated that the industry follows the national debate from afar and tends to respect and trust the US government officials involved.

The US national effort in conservation and use of genetic resources for agriculture is the largest in the world. It is organized in a National Plant Germplasm System (NPGS), which maintains about 440,000 germplasm samples for over eighty-five crops at twenty-two sites throughout the country, including Puerto Rico. Forty Crop Germplasm Committees provide technical advice and guidance to NPGS on germplasm activities. Concerns have been expressed in recent years because of declines in federal funding for NPGS, prompting Congress to request the General Accounting Office to investigate the matter. In spite of these concerns, US collections, made up mainly of material imported from other countries and freely available to all (except, for political reasons, to some countries), remain the largest and most important reservoir of ex-situ resources in the world.

The US consensus described stresses that genetic resources have different values for food and agriculture than for other uses, such as pharmaceuticals; conservation of

⁹ A good summary of the concerns expressed by the various actors involved in agricultural genetic resources issues can be found in the proceedings of a workshop entitled "Intellectual Property Rights III, Global Genetic Resources: Access and Property Rights," organized in June 1997 by the Crop Science Society of America and the American Society for Horticultural Sciences. These proceedings (1998) support our interpretation of a strong national consensus on key strategic issues.

genetic resources for agriculture is a public good that must receive sufficient public financial resources; genetic resources should be freely accessible but not necessarily free of charge; breeders' rights must be protected and respected. Farmers' Rights do not receive much attention except from some NGOs; and the granting of patents to the biotechnology industry does not seem to raise objections of principle. Several specialists, however, believe that in recent years the US Patent Office has not been careful enough, that it has granted patents that were not fully justified and did not respect the normal criteria of novelty, inventiveness, etc. In addition, some in the NGO and academic communities have recently begun to challenge the general acceptance and rapid development of transgenic crops. In spite of these questions, the general consensus on genetic resources remains strong, and this is reflected in the positions taken in international negotiations.

Accordingly, US delegations to the various international fora have relatively clear agendas. In WTO, the protection of IPRs is the paramount objective as far as genetic resources policies are concerned. This will lead to a relentless pursuit of the implementation by all WTO member countries of the TRIPs provisions; hence the dispute with India on its patent law.

In the CBD, the US delegation is at a disadvantage because the US Congress has not yet ratified the Convention and therefore the US is only an observer at the CBD. When the US biotechnology industry became concerned that the negotiations on the Biosafety Protocol of the CBD could lead to trade-restricting provisions, however, US representatives took great interest in the negotiations and became very active, trying to influence other delegations. Indeed, many delegations blamed the US government for the failure of the February, 1999, meeting in Cartagena, Colombia, which was supposed to finalize the negotiation on the protocol. That was interpreted at the time as a clear and conscious decision to settle the matter in the WTO. The fact that subsequently, after the failure of the WTO ministerial meeting in Seattle in December 1999, an agreement was reached on the protocol does not invalidate these earlier interpretations and provides another illustration of the interrelationships among international negotiation fora.

In the FAO Commission, the US delegation stands for the freest possible access to genetic resources of interest to agriculture, pointing out that the federal government spends more than any other actor in the world to conserve large collections of genetic resources and makes them freely available to anybody. The delegation also opposes the creation of a new international fund, knowing full well that if the US government were to accept the idea, it would not be able to convince Congress to approve it. To the surprise of some, the US was a consistent and strong supporter of the Global Plan of Action in the debates leading to the Leipzig Conference in 1996. While it has opposed mandatory funding of the plan, the US has sent signals of intent to support it financially, if and when the plan finds its place in an agreed International Undertaking.

Our analysis of the domestic debate, as presented briefly here, suggests that the range of positions the US delegation to FAO can take is in fact very narrow. Moreover, because so many expect so much (notably funding) from the US, the delegation often finds itself offering nothing at all in order to avoid the criticism that

would be heaped upon offers failing to meet expectations. This situation tends to make the US look more hard-line and intransigent than it might actually be. Nevertheless, the US has failed to articulate a coherent, detailed, and substantive vision of the contributions it is willing to make to a multilateral system; it has typically sought to avoid the charge that its desire is for mandatory access and voluntary benefit sharing. In truth, the US delegation has little leeway to address this issue with a clear offer to developing countries.

Coordination among National Levels in the Special Case of the European Union

The considerable differences among the eight countries studied here suggest why it is difficult to reach an international consensus on genetic resources issues. This difficulty is illustrated by the case of the European Union. Three of the countries in our sample (France, Germany, and Sweden) are members of the EU. The differences among them are much smaller than between these and other countries in our sample. Yet even so, they find it difficult to reach a common position.

During the last few years the EU Commission (Directorate for Agriculture) has initiated through a committee called PROBA—made up of experts from member countries, mainly representatives from agricultural ministries—a process to facilitate development of a common position as regards to the FAO IU. In the last twelve months, focus in the PROBA meetings has been on discussion of texts for articles in the IU that deal with a multilateral system and its coverage: genera or crops (article 12); benefit sharing in a multilateral system (article 14); and financial resources (article 16).

Among issues on which the EU member countries are approaching a common position are the need for a multilateral system for PGRFA and the recognition of Farmers' Rights implying a right to use, to barter, and, in the case of landraces and varieties no longer protected by IPRs, to market farm-saved seeds.

In preparation for the meeting of the IU contact group in Rome in September 1999, during the FAO Conference, the PROBA group noted that they were not able to reach a common position on texts dealing with the articles mentioned. There is disagreement among EU member countries on whether a list should specify which crops or genera are part of the scope of the multilateral system. They also diverge on the extent to which bilateral options can be included in a multilateral system in terms of benefit sharing. On financial resources, member countries disagree on the possible legal links between identified resources (such as CGIAR, Global Environment Facility, etc.) and a governing mechanism for a finalized IU.

In spite of these differences, EU members have managed to agree on several issues related to plant genetic resources for agriculture. For instance, member countries have agreed not to develop access legislation in relation to article 15 of the CBD. Further, within the European Union there are now common directives for plant variety protection, release of GMOs, and protection of biotechnological innovation. However, the last directive has been challenged by Italy, Norway (not an EU member), and the Netherlands through a nullity suit before the European Court of Justice. One of the arguments is that the biotechnology directive should request

patent applicants to provide evidence of prior informed consent or of a material transfer agreement, as is required under the CBD.

III. Typology of Actors

In spite of major differences among the case countries, in terms of size, level of development, complexity of institutional arrangements, and other factors, it is striking to note that all the actors interviewed can be classified in a small number of broad types—government agencies, the research community, the private sector, NGOs—and there are many common features for each type across countries.

Government Institutions

In each country, formal rules dictate general decision procedures within an agency or ministry and procedures for consultation, deliberation, and if needed, conflict resolution among government agencies. These are not sufficient, however, to ensure communication, coordination, or even consistency in the policies of different ministries.

In all countries studied here, the Ministry of Agriculture is the lead agency on PGR issues, representing the government in FAO and therefore in the Commission for PGRFA.¹⁰ Similarly the ministry in charge of environment is the lead agency in CBD. For WTO, the name of the ministry concerned varies from country to country, but it always deals with trade and commerce and is, of course, distinct from the ministries of agriculture and environment. The differences among these three types of ministries in terms of concerns, responsibilities, staffing, and institutional culture are probably greater within a country than for each type across countries. Each of these sectoral ministries has specific and often exclusively sectoral concerns. In addition, the Ministry of Foreign Affairs usually plays a coordinating role because international negotiations are involved. Similarly the ministry of law (or of justice) often provides technical advice on legal issues. But its role is restricted to that of technical advice. In some countries, the legal advice is provided through other means. Finally the Ministry of Finance (or the Treasury) is consulted prior to any commitment of financial resources. Invariably, these agencies resist any such commitment.

In every country in our small sample, except perhaps Kenya, the ministry of agriculture carries significant political clout because it has a strong constituency: farmers' organizations in OECD countries and, to a lesser extent, in India and the Philippines. In India, concerns for food security give the Ministry of Agriculture additional clout. But in each agriculture ministry, genetic resource issues do not usually loom large on the minister's agenda. These issues are probably seen as too obscure and too technical to generate high political pressure. As a result, the file seems to be handled essentially by technicians of, or closely linked to, the national research institutions. Their main concerns to begin with are related to access to genetic resources for plant breeding. In the process of reaching a national position, they take on board additional concerns expressed by other government agencies and in some cases by other actors involved in the policy debate.

¹⁰ See later discussion for the US exception.

The ministries of environment were created more recently than the ministries of agriculture. They generally have a more diffuse constituency and it is probably fair to say that they generally carry less political clout than do agriculture ministries. Yet, paradoxically, in a growing number of countries political leaders at the highest level (presidents and/or prime ministers) are politically sensitive to the concerns expressed by environmental ministries. Protecting biodiversity is of course one such concern, and this is typically seen not as an agricultural but as an environmental issue. The staffing and institutional culture of these ministries tend to give more weight to protection of natural habitats and to species diversity than to agro-biodiversity. At the international level, access and benefit sharing approaches appropriate for rare and endemic species (a typical ministry of environment concern) have strongly influenced the debates over PGRFA, where a less “transactional” and a more cooperative approach once held sway.

Ministries of commerce have little understanding of genetic resource issues, but they are aware of the debates on the protection of intellectual property in international trade agreements (e.g., TRIPS Agreement in WTO), and as a result, even in countries where patents are controversial, commerce ministries are mindful of the TRIPS commitments entered into by their governments.

Beyond these common features across countries, there are significant differences. In the US, the State Department (i.e., the ministry of foreign affairs) is now the lead agency both in the FAO Commission and in the CBD. Interagency coordination mechanisms vary from one country to another. Formal and informal arrangements play an important role in this context. In the French and Indian bureaucracies, such mechanisms are long-standing and well established. Yet in all countries, small and large, rich and poor, coordination seems to be difficult.

Another source of variations across countries relates to the interactions between ministries and private actors (industry associations, NGOs). But here again, it was easier to observe differences in procedures and frequency of contacts than to detect many significant differences in the influence exerted by these private actors. The exceptions are NGOs in India and the Philippines and the private sector in the US on TRIPS. In addition, it is interesting to note that in several instances the parliament has been a significant actor in the policy debate. Not surprisingly, this has happened when legislative action was required and some actors were able to block the proposed legislation (e.g., nonratification of the CBD in the US, opposition by NGOs to strengthening of the patent law in India).

The Research Community

In all countries one may find members of research institutions, particularly geneticists and plant breeders, who are well aware of the value of genetic resources, of the threats to their conservation, and of the difficulties that must be overcome to ensure such conservation. But there are indeed major differences across countries in size of endeavors, institutional complexity, and professional consensus on the main strategic options for conservation and use. Recall that our sample includes such diverse countries as Brazil, France, Germany, India, Kenya, the Philippines, Sweden, and the US.

In all cases, the research community is concerned with access to genetic resources as necessary inputs into any breeding program. Researchers in developing countries also express concerns about “fair” compensation for the effort of past generations. They greatly resent “biopiracy”—the plundering of the biodiversity riches of the South by firms from the North, or the developed countries. Developed-country scientists are more concerned about preserving easy access, preferably free. But many could easily accept the principle of some fair compensation. They know, however, how difficult it would be to obtain commitments of extra public funds in their own countries, and they are intimately convinced of the mutual benefits derived from a multilateral exchange system, which they see to be under great threat in the current international stalemate.

The main difference across countries in the role of the research community is probably related to the modalities of its engagement in the policy process. In countries where there is a small research establishment, individual scientists have a virtual monopoly (note that this is not exactly so in any of the countries in our sample). By contrast, in countries with a large research establishment (e.g., Brazil, India, and the US), somewhat formal processes exist to formulate a collective view of the profession and/or of the research establishment. Yet it is striking to note that even in these large countries, prominent individuals emerge and exert strong leadership roles, which legitimizes them as spokespersons of the research community in the broader policy debates.

The Private Sector

In six of the sample countries (i.e., excluding Kenya and the Philippines), an active private seed sector has an important stake in genetic resources issues. The political clout of this sector is not great because of its relatively minor economic importance. But seed companies often collaborate closely with plant breeders from the public sector, where many employees of the seed sector often began their careers. Hence it is probably safe to assume that together they form what some political scientists call a “power cluster.” Accordingly, the private seed sector has access to the policy-making process. Its main concerns are access to genetic resources and protection of breeders’ rights.

Another potential stakeholder group from the private sector consists of biotechnology firms. Somewhat surprisingly, these or their collective organizations do not seem to have taken a great interest in the international negotiations on access to genetic resources. Their main concern in the debates discussed in this study has been IPR protection. Together with many other industries interested in IPRs, they have strongly supported the insistence of the US government on including TRIPs provisions in the WTO. More recently, in the US at least, the biotechnology industry has also become active in negotiations for the Biosafety Protocol of the CBD, opposing provisions considered too restrictive of trade.

NGOs and Civil Society

In developed countries few NGOs take a keen interest in agro-biodiversity issues. When they do, they tend to support the fairness arguments developed by

NGOs of the South. This reflects and may explain the very limited mobilization of public opinion and civil society on those issues in the North.

The situation is sharply different in India and, to a lesser but still significant extent, in Brazil, the Philippines, and Kenya. In India, where many NGOs are active, they express a diversity of concerns, but their main thrust hinges upon distribution of benefits. This is true within the country, where they insist that “tribals” and other local communities must receive a fair share of benefits derived from genetic resources they have conserved over generations (i.e., what is known as protection of Farmers’ Rights). They are also much concerned with the sharing of benefits across countries, resenting biopiracy and the appropriation of these resources through inappropriate patenting, by private biotechnology and/or seed companies, mainly from Northern countries. Similar concerns have been expressed by many NGOs, international and national, in both Northern and Southern countries.

IV. Policy Interactions

Country situations and positions in international negotiation fora are extremely diverse and indeed sometimes conflicting. This is the main reason why those national positions are difficult to reconcile and therefore why the international negotiations on genetic resources for agriculture are moving so slowly that one may speak of paralysis or stalemate, in the international negotiations. Concerns in many developing countries about biopiracy and expropriation of their natural resources through gene patenting are major stumbling blocks for the emergence of an international consensus. But it is important to note that, as indicated in the previous section, the main differences among countries cannot be explained by major differences within the same types of actors across countries. Rather, what seems to matter is the particular cast of characters active in each national policy debate and the relationships among these actors, which determine the relative influence of each. The purpose of this section is to characterize and explain, as much as possible, that diversity.

The main fault line, so to speak, can be found around benefit-sharing issues: some give highest priority to IPRs, others to the benefits they hope to derive from the “natural” genetic resources found in their territory. For some of the latter, the issue of Farmers’ Rights is seen as closely related and important as well. This, as we shall see, leads to another major divide: between those who give high priority to the conservation of the existing (or renegotiation of a new) multilateral system and those who would be willing to accept a regime of multiple bilateral agreements. Of course, the ability of the international community to reconcile these differences will depend largely on the ability of various government representatives to offer compromises; and this will depend critically on their ability to listen and to be flexible. In particular, they will have to have the necessary clout to balance trade-offs and to make choices. On this score, the various countries studied here differ substantially.

Valuing and Paying for Genetic Resources

Valuation of genetic resources and compensation for their use to those who control them are at the heart of the current debate, as discussed in the introduction.

Economic theory suggests that genetic resources found in nature and knowledge/information about genetic resources can be considered as two strictly complementary input factors in the production of such useful goods as improved germplasm, including new crop varieties. In such cases, economic theory teaches us that the value of each input depends on the value of the final product and on the markets for each input (i.e., the natural resource and knowledge). If there is no market for the individual inputs, as is the case here because the two cannot ever really be separated, the share of each in the value of the final product has to be negotiated between the two owners. In the case of genetic resources for agriculture, the situation is further complicated because property rights are not clearly established. The current slow progress in international negotiations can be interpreted as a result of these difficulties and even as a part of this bargaining. Accordingly, for some countries that are rich in the capacity to produce new knowledge, such as the US, it appears that increasing the realm and the clout of IPRs is the main concern of government representatives in international negotiations, IPRs being viewed as the best way to ensure that those who contribute new knowledge will be economically rewarded. The main beneficiaries would be private sector firms in the seed and biotechnology sectors; it is thus not surprising that these sectors lobby strongly in favor of IPRs and that because of the clear comparative—and even absolute—advantage of the US in this area, the US government is legitimately sensitive to those interests.

On the other side of the spectrum, a country such as Kenya insists that natural genetic resources be rewarded and that international rules and procedures should be such that the value of these natural resources be recognized and compensated for by those who use them. One major problem of course is that all genetic resources used in agriculture embody a lot of knowledge, particularly that of the many past generations which domesticated and improved the germplasm of cultivated plants, especially through traditional selection. In addition, Kenya is not particularly rich in genetic resources for agriculture.

Other developing countries studied in this work, India and the Philippines, are rich in terms of natural genetic resources, traditional crop germplasm, and scientific research capacity. All of them have lively domestic policy debates with a significant presence in the debate of a vocal NGO community; one can understand, then, why these countries are much less interested in IPRs, with some segments of society in India, and to a lesser extent in the Philippines, adamantly hostile to patenting. For these actors, recognition of Farmers' Rights is essential. The result of the interplay of actors at the national level is such that Farmers' Rights are high on the negotiation agenda of government representatives from these countries. This analysis also indicates why these considerations are of greater concern for India and also for the Philippines than for Brazil: given its vast territory and relatively lower population density, Brazil is more concerned with biopiracy, which is seen as stealing from the nation rather than from specific local communities. Note, however, that the discussion here is in relative terms. Indeed, Indians and Filipino and their governments are also greatly concerned with biopiracy.

The European countries in our sample (France, Germany and Sweden) find themselves in a somewhat intermediary position in the range of perspectives on the

value given to genetic resources. The domestic policy debate in these countries is dominated by a cluster of actors involved in seed production; however, the private biotechnology industry has a lesser role than in the US as regards both economic activity and political clout. As a result, representatives of these European governments in international negotiations are less aggressive on IPRs than are their American counterparts. Perhaps for this reason, they seem more able and willing to listen better to the concerns of developing-country representatives regarding Farmers' Rights, even if they too have shown great reluctance to put in place mechanisms that would offer financial compensation for the use of genetic resources from developing countries, be it on a bilateral basis or through a multilateral mechanism such as the establishment of a new fund for genetic resources.

Commitment to Multilateralism

In all countries, the sector of the agricultural research community that is aware of international negotiations is keenly aware of the dangers to crop improvements posed by the collapse of the former multilateral regime. Characterized by free access to genetic resources and to new scientific knowledge, that regime permitted multiple exchanges of germplasm and knowledge, the latter being often embodied in numerous scientific staff exchanges. Hence it is not surprising that this community is unanimous in supporting the conservation of this traditional order or the negotiation of a new one that would salvage its essential features.¹¹ But in each country, the agricultural research establishment exists in a particular political context. Depending on such national circumstances, the scientists have different opinions on what elements will be needed to maintain a multilateral system for agricultural genetic resources. Their priorities may also be different: developed-country scientists focus on the need for full guaranteed access, while developing-country scientists focus on the need for guaranteed benefit-sharing arrangements. Few countries and few actors stress the need for both. These differences between countries explain a large share of the debates in FAO, where the research community is generally well represented and sometimes even dominant in the national delegations dealing with genetic resources issues.

Thus the US research community, which has a dominant voice in the US Department of Agriculture, has been able to convince other US officials—particularly those of the State Department, who now lead the US delegation in the PGRFA Commission and in the CBD bodies—of the value of a multilateral system, even though the US has the largest collections of crop germplasm. But these scientists also know that it would be futile to oppose within their government the push for greater recognition of IPRs; and they are aware of the great political difficulties that would have to be overcome for the principle of establishing a new international fund to be accepted.

The contrast with the Indian research establishment is particularly striking, especially if one bears in mind that many US and Indian scientists were trained in the

¹¹ In most countries that scientific community's position in favor of multilateralism is supported by the traditional seed industry; but strangely enough, seed industry organizations do not seem very vocal on this matter. Often relatively weak, these organizations give priority to shorter-term policy issues.

same schools, attend the same professional conferences, and have been collaborating closely for many years in the establishment of the National Bureau of Plant Genetic Resources in India, with substantial financial support by USAID. Given their domestic situation, Indian researchers are well aware of the need to get recognition of Farmers' Rights, are strong advocates for the establishment of an international fund, and are vocal critics of the "excesses" of the US Patent Office.

The European research community, supported by representatives of the traditional seed industry, are freer than both their US and Indian colleagues to speak up in favor of a multilateral system. The main forces challenging the multilateral regime (patenting and restriction of free access) are not strong in Europe.

The case of Brazil stands perhaps as an exception, or at least at the weakest end of the range of national positions in favor of multilateralism within our small sample. The conviction that the country possesses a wealth of biodiversity, much of it yet unknown, may lead to a national consensus in favor of bilateral arrangements. These would seem to maximize the probability that the country could derive substantial benefits from the discovery of some wonder plant, such as the rubber tree in the nineteenth century, which was exported away without any benefit accruing to Brazil. In such circumstances, committing to multilateralism may seem to be taking too great a risk, because it could turn out to be against the national interest. Accordingly, the Brazilian delegation in the PGRFA Commission has been one of the most restrictive as regards the list of crops that could be subjected to a special multilateral regime. Yet Brazil may be happy to accept a multilateral system as long as its scope is limited to materials Brazil lacks (germplasm of major crops) and as long as the benefit-sharing agreement does not prejudice or set a bad precedent for arrangements concerning the non-PGRFA materials, which Brazil has in abundance in the Amazon region.

Coordination among Government Agencies

In each country studied here, a mechanism exists for coordination among the various government agencies involved in genetic resources issues, particularly when ongoing international negotiations call for the formulation of a national position. Such coordination mechanisms exist, of course, in many domains. They seem to work better for some domains than for genetic resources and better in some governments than in others. In our sample, the case of the US in this respect is noteworthy. The lead role in the PGRFA Commission shifted from the Department of Agriculture to the State Department when the renegotiation of the International Undertaking entailed possible legally binding commitments. This is an instance of "escalation" of an issue within a government bureaucracy, to ensure that the issue under consideration receives the attention at the appropriate level of decision making. Brazil, according to outside observers, seems to be another case where formal mechanisms of coordination among government agencies appear to work for genetic resources issues, at least for articulating in international negotiations a well-reasoned and well-prepared position, incorporating the concerns of several agencies.

As was shown in the previous section, such is not generally the case. In most instances the link with officials dealing with international trade issues does not exist

or does not work. Commerce ministry officials, for example, have been able to ignore any call for an exception to the TRIPs provisions of the WTO in the case of agricultural genetic resources. Similarly, within the US government, USDA and State Department officials dealing with agricultural genetic resources do not have the necessary clout to initiate the process that could lead to restricting the US Patent Office in its decision to grant patents liberally on crop germplasm.

Another reason for lack of effective coordination across ministries is the fact that developing national policy positions is a knowledge-intensive procedure, demanding long-term monitoring and institutional awareness of issues cutting across sectors; such knowledge is critical for the compatibility of positions taken by the same government in different international fora. Our analysis of the country cases reveals that in most countries, this knowledge is at best concentrated among a small number of individuals. Few mechanisms seem to be available at the national level to ensure long-term institutional memory regarding policy evolution and feedback to the national level from results in different international fora. Why might this be the case and how can it be acted upon?

The example of the Swedish government may help us answer this question. Six or seven ministries are actively involved in different aspects of managing genetic resources. The staff dealing with genetic resources issues are part of the regular government service structures, where focus normally is on day-to-day political activities. The average turnover of executive staff in senior positions in government ministries (i.e., assistant undersecretary, *departementsråd*) is between 24 and 48 months. For a less senior staff member (i.e., deputy assistant undersecretary, *departementssekreterare*) the turnover is between 36 and 48 months. The civil servants are then moved to other responsibilities and even other ministries. One may raise the question here whether this length of assignment encourages and rewards long-term learning, intellectual curiosity, and awareness of structural situations or rather encourages quick and superficial learning, neglecting past events, lessons learned, and links across sectors and fora.

Unless ministers insist that long-term and in-depth analysis is needed to develop policy positions, preparations for upcoming international meetings may rather focus on short-term issues. Sector-based, day-to-day political agendas cannot contend with the complexity of genetic resources management.

Implications for Access, Conservation and Utilization of Genetic Resources

The implications of the decision-making process at the national level described in this chapter should be a source of great concern and even pessimism for those who value the advantages of the multilateral regime of free access and exchange of genetic resources and scientific knowledge, which has been critical to agricultural progress all over the world at least in the last decades. Conservation is a pure international public good, which seems to be underfunded. Access is being threatened as many countries, responding to the CBD and also, though more indirectly, to the TRIPs provision, are developing legislation that will regulate and undoubtedly restrict access; several CGIAR centers quietly report more and more

difficult negotiations with their host governments on the international distribution of germplasm. Utilization is thus also threatened.

Unquestionably, the growth of private sector investment in crop breeding research, including in biotechnology for crop breeding, represents a major boost to total investment in agricultural research; and that should lead to increased total utilization of genetic resources for agriculture. But a new regime harmoniously combining the relative contributions of the private and public sectors has not yet emerged. In this context the production of public goods, such as conservation, is threatened, and the threat is particularly serious for international public goods. Yet reaching an international agreement should not be so difficult, given the stakes involved. ***After all, most of the countries studied here, as well as others, seem to support the idea of a multilateral system for access and benefit sharing associated with the use of genetic resources for agriculture.*** The main problem however, as revealed by this analysis of decision making at the national level, is that reconciling the conflicting positions of the various governments requires an ability to make concessions. And these can only be made if each government concerned is in a position to appreciate all the trade-offs involved. With fragmented decision making and with genetic resources issues not reaching high enough levels of government, this has not happened. One wonders what crisis will be needed for awareness of the high stakes to creep up the decision-making hierarchy.

Chapter 3

Implications for the International Negotiations on Genetic Resources

Some of the difficulties governments are having in developing and coordinating biodiversity policies and positions, both for internal purposes and for use in multiple intergovernmental negotiating fora, are examined in the preceding chapter. The CBD initially helped focus attention on the usefulness and potential value of biodiversity. With its coming into force, governments have turned much of their attention to the nuts and bolts of implementing the Convention, finding in the process that it is easier said than done.

During the negotiating process leading to the Convention, governments explicitly chose to treat agricultural biodiversity somewhat differently than other types. Given the passion with which governments reaffirmed their rights of national sovereignty over biological diversity, and the role they gave to each country in regulating the terms of access to its diversity, it is noteworthy that delegates recognized that somewhat different rules would be needed for agricultural biodiversity. As discussed in Chapter 1, negotiations on PGRFA began at FAO, with the express and repeated blessings of the negotiating and governing bodies associated with the CBD.

Since the CBD essentially reaffirms countries' rights to make bilateral arrangements regarding their biological diversity, one can logically assume that delegates to the CBD assumed a need for, and delegates to FAO have been working toward, a multilateral system or a mixed multilateral and bilateral system for dealing with PGRFA. Were a multilateral system not assumed, the bilateral framework of the Convention (with access according to prior informed consent and on the basis of mutually agreed terms) could simply have been applied to PGRFA, obviating the need for further negotiation. The inconvenient problem of what to do with preexisting PGRFA collections and the difficulty of establishing a country of origin for the materials might have remained. But this, presumably, is precisely why delegates realized that a multilateral as opposed to a purely bilateral approach would be necessary for these particular biological materials.

In assessing the implications of national decision-making processes and policies on international negotiations, one must therefore focus on the multilateral approach. The bilateral approach being the "default," a successful conclusion to the negotiations over PGRFA hinges on whether delegates at FAO can agree to the terms for a multilateral component.

The ingredients needed to construct a workable multilateral system may be somewhat different, and more numerous, than those for concluding a legal agreement on this same subject. If the FAO IU is to lay the foundation for an effective multilateral system, what are the prerequisites for a successful conclusion of the negotiations? What are the hurdles? And what lessons or conclusions of relevance to these questions can we draw from the case studies in Chapter 2?

It could be argued that a genuine resolution of the current stalemate will require:

- ✍✍ Greater understanding of the inherent limitations and even dangers of relying on bilateral agreements to manage the conservation, exchange, use, and benefit sharing for PGRFA¹², including recognition of the substantial technical difficulties and transaction costs associated with determining ownership, which must be ascertained prior to starting down the bilateral path. Also needed is a more realistic view of both the use and the monetary value of PGRFA within breeding programs and of the difficulty of extracting the monetary value of any particular accession or its components.
- ✍✍ Willingness to cede certain claims of ownership or control over certain PGRFA materials to the international community (or to parties to the agreement) and, as a consequence, to accept at least a minimum degree of accountability toward and responsibilities under the multilateral system. Accountability would imply that some aspects of governance (policies, etc.) be vested at the international level. Responsibilities toward the system would include provision of necessary funds and/or in-kind contributions.
- ✍✍ An understanding of the ways in which IPR could legitimately be applied (or by common consent, agreement, or understanding could be restricted from applying) to biological materials within the multilateral system—materials which would essentially be in the public domain.
- ✍✍ Willingness to include in the multilateral system a compelling number of crops, and a broad enough range of materials within those crops, to make the system sufficiently attractive to a critical mass of governments and other supporters. A system too narrow in its coverage or content is not likely to gain much political or financial support and thus is not likely to address adequately the issues under debate.
- ✍✍ Consensus on what constitutes benefit sharing within the multilateral system. Cash transfers for unspecified (i.e., non-PGRFA related) purposes are unlikely. But opposition to any real, visible, and secure benefits is equally unproductive. One need only recall that it was largely the lack of guarantees of benefits that doomed the original IU and sowed the seeds of the present conflict.

The unexpected approval of a draft article on Farmers' Rights during the April 1999 meeting of the FAO Commission demonstrates that anything can happen in negotiations. It follows, therefore, that delegates might produce more surprises and conclude their negotiations with an agreed, legally binding International

¹² Many countries pressing for measures that would restrict flows of genetic resources do not seem to be aware that, in the case of genetic resources for agriculture, they are themselves great net beneficiaries of the existing system of essentially free flows. For preliminary but compelling empirical evidence, see Fowler, C. and Smale, M. "Germplasm Flows Between Developing Countries and the CGIAR", Paper presented at the Global Forum for Agricultural Research, Dresden, May 2000 (To be published). The same authors are marshalling more evidence to be published in the next few months.

Undertaking—even without satisfying all four requirements outlined here. We are not so much interested in predicting whether a new IU will be agreed as in analyzing whether the necessary conditions exist for solving the problems under debate. Good agreements are built not just on consensus but on commitment. They can neither ignore conflicts nor deflect them indefinitely with skillful wordsmithing. An approved IU that sidesteps the requirements outlined is an agreement unlikely to provide more than a partial or temporary solution to the tough issues.

If genuine and more lasting solutions are contingent upon the fulfillment of all these conditions, what insights can be gleaned from the case studies summarized in the previous chapter? What conclusions relevant to the international negotiations can be drawn from our study of national policies and policy-making procedures?

First, and most obviously, at the national level there will need to be more extensive coordination of policies between ministries. They will need to reconcile their often different and conflicting views. This will be difficult to accomplish unless the issues are “pushed up” to a level in the government where contradictions between ministries can be resolved. Sadly, this has rarely happened in the area of crop genetic resources. Historically, those actors—individuals and institutions—which have had an interest in creating new structures and arrangements for managing PGRFA have not had access to the halls of power. They have not been able to carve out a niche for PGRFA that would allow these unique resources to be treated uniquely. Repeatedly, PGRFA have become entangled in nets designed for bigger fish—bigger fish at the WTO and the CBD, for instance. Can a multilateral and cooperative system for the conservation, use, and benefit sharing of PGRFA be agreed

- ✍✍if the bilateral bias of the CBD blinds those in ministries of environment focused on protecting and profiting from rare species of medicinal interest in the rain forests?
- ✍✍if the desire to protect the software and biotechnology industries prevents all initiatives that would ensure that this public good remain in the public domain?
- ✍✍if funding constraints—which do not seem to be insurmountable in either developed or developing countries when it comes to costly new military initiatives—prevent the ratification of an agreement that really would assist conservation of PGRFA, really would promote their use, and really would facilitate the generating and sharing of benefits, even on modest terms?

While FAO delegates remain cloistered in the “Red Room” and the “German Room” at FAO’s Circo Massimo headquarters, the political and legal milieu outside is changing. More than thirty countries are considering legislation to regulate access to biological diversity (see Appendix). A number of countries have already adopted regulations on the matter. Virtually all of these instruments would have to be modified to accommodate the more open and cooperative system envisaged by proponents of a multilateral system—a prospect which may complicate and delay some governments’ approval of the final Undertaking. And while legislative actions and case law are extending the scope of IPRs, negotiations at FAO drag on, and trust

among those working to care for and exchange PGRFA becomes increasingly strained. Moreover, while trade, IPRs, and financial decisions seem to be made at rather high levels in governments—or at least with high-level backing—those laboring for PGRFA tend to be much lower in the pecking order. How can a low- or medium-level agriculture ministry official assert PGRFA's need for policy priority over the pronouncements of the trade minister that IPRs will be protected, or over the finance minister's indication that no new funding obligations will be agreed to by the government? The case studies presented in the previous chapter reveal PGRFA advocates taking one turn after another in a desperate attempt to get out of a maze, which up to now has had no exit. Meagerly endowed with political power and often lacking in technical expertise, and poorly coordinated between ministries, these advocates and FAO negotiators would seem ill-equipped to win the battle for a multilateral system.

If the picture we have painted is bleak, it is not without hope. The strongest evidence that all is not lost, however, is found by going beyond the case studies forming the substance of this report. As already noted, FAO negotiators have recently made surprising progress on the once intractable subject of Farmers' Rights. Sentiment for a multilateral approach appears to be growing. Discussions are becoming more concrete and more focused. Many delegates have begun to appreciate the fact that in many ways, the CGIAR centers—with their agreements placing a significant portion of the world's unique germplasm "in trust" under the auspices of FAO—constitute an already functioning multilateral system that can be added to and strengthened through the IU. Were CGIAR centers to take a more proactive role in the negotiations, as was suggested during the CGIAR Mid-Term Meeting in Beijing in May 1999, then the technical requirements of a workable multilateral system might be better understood and thus better protected and advanced in the negotiations.

Finally, negotiators may choose to use the FAO Global Plan of Action, adopted by 150 countries, for its original political purpose. The plan was meant to answer questions about what would be done with monies in an international fund associated with the Undertaking; that is, what benefits could be expected from a multilateral system that included an agreement on access and exchange. The Global Plan of Action could help provide a vision, a purpose, and a goal—not to mention tangible benefits—were it to be used as a framework for generating benefits within the context of the Undertaking. A solid commitment in the Undertaking to implementation of the plan might then become the agreement on benefit sharing.

Such factors as these may have profound implications for the negotiations, even though they fall outside the scope of the present study and can only be mentioned here in brief.

In summary, negotiators trying to develop a functional multilateral system for PGRFA must grapple with a number of complex issues, some technical, others political. Their ability to do so successfully is limited by their own lack of power and authority within their governments, by fragmented policy making at the national level, and by the existence of competing and more powerful actors within their own governments—actors demanding that priorities, preferences, money and attention be

directed elsewhere to other interests. In such a context, negotiators have little to offer and not much room in which to maneuver, to be creative, or even to be open-minded. This does not preclude an agreement being reached. But it makes that more difficult. More importantly, it reduces the chances that the agreement will actually solve the problems and thus prevent the struggles from going on and on.

Chapter 4

Consequences for the CGIAR

Previous chapters have highlighted major causes for the failure to develop coherent policies for genetic resources at both the national and international levels as well as implications for future conservation and availability. The concept of a solution through a multilateral system for exchange and use, rather than bilateral agreements, has also been discussed.

The potential failure to reach agreement within and across national boundaries is of urgent importance to research organizations, especially those relying on open access and free availability to generate international public goods for developing countries. The international agricultural research centers of the CGIAR are the largest global producer of international public goods in terms of agricultural research for developing countries, and the single largest holder of genetic resources for food and agriculture. They stand to be the most affected of all research organizations should negotiations fail to reach agreements. Once considered an important conduit for the flow of genetic resources and improved technologies between North and South, the CGIAR centers now find themselves caught squarely in the middle of the tensions arising from opposing perspectives. Their situation is made more precarious by the uncertain legal status of the 500,000 accessions they hold in trust for humankind and by their lack of any legal authority and position to influence decisions.

Failure to reach decisions in international fora results in the lack of a clear external enabling policy framework within which the CGIAR centers can work. Lack of such a framework has the potential to threaten what the CGIAR centers have to offer the developing world as they seek to eliminate poverty and improve food security. It also promotes an uncertain internal policy environment at both the center and the system level. The donor community of the CGIAR—those who establish policy guidelines at the system level—comprise the same diversity of viewpoints and perspectives as in the international community at large. Consequently, internal policy guidelines are often too general to provide clear direction and are not always unanimously supported. Centers, with legal authority to set their own policies, are left to determine what those policies will be within the context of a confused internal and external policy environment.

The historical strength of the CGIAR can largely be traced through its activities with genetic resources in commodity research centers. Collectively, its success has been through acquiring, distributing, using, and promoting use of genetic resources in producing international public goods for developing countries to overcome production constraints of major food crops. In the process, it has also increased the flow of genetic resources to industrialized countries as well as the resulting flow of improved technologies back to developing countries. The training programs of the CGIAR for increasing capacity of national programs to adapt and develop technology based on genetic resources are well recognized.

Acquiring and Distributing Genetic Resources

A cornerstone of CGIAR success is its genetic resources collections. CGIAR centers hold in trust for humankind over 500,000 accessions of more than 1,300 different species of plants. These were mostly collected before the CBD came into effect in 1993.¹³ Many of these accessions would have been lost over the past decades due to environmental degradation, habitat loss, internal strife, and other reasons were it not for the efforts of the CGIAR to seek them out, collect them, put them into safe growing conditions, and commit to a long-term conservation plan. In doing so, the centers have invested funds provided by the international community, particularly funds from development assistance budgets.

The CGIAR centers have made the germplasm freely available, with thousands of accessions distributed over the years, mostly to developing countries. The system of acquisition and distribution is a model of free access, a true "multilateral" and apolitical system, for all CGIAR-held crop species.

In many cases, accessions collected in a particular country or region of the world have been repatriated by CGIAR centers following natural or man-made disasters in the originating country. This service has been of great value to the repatriating countries in returning their native species, restoring seed production systems, and repairing social traditions and structures. It could not have been accomplished without the open distribution policy of the CGIAR and the investment of development assistance funding.

Using Genetic Resources

A second cornerstone of the CGIAR research agenda has been to increase productivity through the most extensive, collective, international breeding programs in the world. Breeding better varieties of food crops has been intelligently and efficiently organized by CGIAR centers on a global scale. The distribution of new genetic combinations to national partners, and even directly to farmers and farm communities, for use in variety release or in further breeding has resulted in the release of hundreds of locally adapted varieties. Increasingly, CGIAR centers are now working in direct partnership with small resource-poor farmers to select varieties in response to local needs in a participatory manner. The farmers themselves are able to choose the traits they believe are most important for their success.

The international dimensions of releasing varieties and providing valuable traits to national breeding programs are possible only through the research effort of collecting, characterizing, evaluating, and recombining traits from the CGIAR genetic resources held in trust. The results and the value of the collective CG work are well documented.

¹³ Collections made after the CBD came into effect can only be designated as "in-trust" and freely available if the contributing country agrees.

The Future at Risk

The ability of the CGIAR to continue to acquire, distribute, and use genetic resources in the future is compromised by uncertainty and indecision at the international level as described earlier, and by specific interpretations of national and regional legislation by countries controlling access to their resources. The conditions of the past—free access and distribution policies—provided the enabling policy environment for the success of the CGIAR centers in acquiring and using the germplasm that would benefit agriculture in developing countries. That enabling environment is now seriously threatened.

The effects on CGIAR centers are slowly evolving. Although the CBD has now been in effect for seven years, there is little evidence that the day-to-day work of the CGIAR has been negatively affected in a significant way. More than likely, this is due to the uncertainty of the legal status of the collections, and the reluctance of most countries to take any steps as regards those collections without international agreement. Some centers report that countries with which they interact are reluctant to respond to any questions on genetic resources issues until they know the outcomes of debates at the international level. They report that some countries are “waiting for an agreement.” This introduces both delay and uncertainty into center activities and clearly links national policy outcomes with what is happening at the international level, specifically to the ongoing FAO efforts to mediate an agreement on a multilateral system that would include major food crops at a minimum. Although isolated instances of difficulty in moving germplasm, or restrictions associated with new holdings, have been encountered, centers largely are going about their business much as they did before the CBD came into effect, although with an increased awareness of the issues and sensitivity to national policy positions.

The most serious and defined threat to the CGIAR model of open access and unrestricted use perhaps comes from potential national legislation in an increasing number of countries. As mentioned in previous chapters, issues of intellectual property rights, benefit sharing, and protection of indigenous knowledge have taken center stage and are often driving the policy debates. Within those debates, the threat is not only to the CGIAR multilateral model of open access with respect to in-trust collections but also to the products of the use of those collections; that is, to the advanced breeding materials and varieties produced. This is especially true for centers located in the Andean Pact region, where the regional agreement goes far beyond the CBD in defining what must be covered by national access legislation. For example, in a recently published article on implications of Andean Pact Decision 391, Ruiz (1999) states that in the most extreme interpretation, neither the International Potato Center (CIP) nor the Centro Internacional de Agricultura Tropical (CIAT) would even be able to carry out a field test with material derived from (i.e., advanced breeding lines), or originally collected in, Peru or Colombia respectively, without the approval of the national authority.

There is also concern now, even within the CBD (Conference of the Parties), that through overly restrictive legislation now under consideration on access to genetic resources, countries may unintentionally close off the option of adhering to a multilateral system.

By virtue of the same model that has served developing countries so well in the past with respect to the generation of international public goods—that is, free and open access to the in-trust collections regardless of whether the user is a public organization or a private business—centers now find themselves facing a situation where their role in the distribution and use of genetic resources could change drastically based on the interpretation and content of national legislation. And the interpretation and content are driven more by fear of biopiracy by the private sector, with resulting loss of benefits and loss of access through application of IPRs, than by consideration for the implications to research in the interest of international public goods. Results of such a change in role, perhaps from one of free provider to one of mediating distribution and use based on the future flow of potential benefits, are unpredictable and reflect the changing roles of the public and private sectors in agricultural research in general and use of genetic resources in particular. However, one almost certain result would be a reduction in the flow of international public goods emanating from genetic resources—including conservation itself—from centers to developing countries. Combined with the increasing difficulty of maintaining targeted funding for the generation of such goods, the additional uncertainty of acquiring and using the biological resources on which they are based will surely further hamper development efforts in alleviating poverty and assuring food security.

Even though the in-trust collections of the CGIAR are not specifically treated in the CBD itself, their status is expected to be resolved within the framework of the FAO IU as discussed in the previous section. Should no agreement be reached through this forum, it is generally believed that the collections cannot be maintained indefinitely outside the system of access mandated generally by the Convention and more specifically by regional agreements and national legislation. To address this dilemma, specific conditions for the more limited-scope multilateral system mentioned earlier are being debated in FAO, at the request of the Conference of the Parties of the CBD. The failure to implement a continuing successful system would have serious future consequences for the CGIAR centers.

The most serious challenge for CGIAR centers, and for their ability to continue to be effective, is to envision an enabling framework that allows the generation of international public goods to continue unhampered. For example,

- ✍✍ How can (or should) centers hold germplasm to protect and conserve increasingly threatened important species of food crops if they cannot freely share or use the germplasm and maintain their research function?
- ✍✍ How will centers be able to use currently held genetic resources and/or those acquired in the future for crop improvement in their own programs to generate international public goods—that is, goods for use outside the source country?
- ✍✍ How will centers be able to make genetic resources available for partners to use in improving their own varieties, especially if those partners include the private sector and multinationals, an increasingly likely event?

- ✍✍ Will centers have freedom to negotiate or mediate IPRs in order to assure that products of centers' programs continue to be freely available to those who need them when no monetary benefits are directly generated?
- ✍✍ How will centers assure that benefits from use, when they do accrue significantly, are shared in an equitable way with the countries that originally provided access to germplasm?

These are only a few of the questions that must be addressed in the policy framework so that CGIAR centers can continue to function in a changing environment. The answers are technically and politically sensitive and depend on harmonizing viewpoints both within countries and at the international level. A parallel but related set of questions deals with the interaction of the centers with the private sector in order to access technologies to improve utilization of genetic resources and at the same time protect source country interests.

A final set of questions relates to the voice that the CGIAR will have in the process of deciding its own future through its role at the national, regional, and international levels. The CGIAR itself has no legal status on which to base interventions. To influence opinions, it can only use its reputation as an apolitical, research organization and the trust that it has built over the years. A centrist and centralized approach has been the CGIAR *modus operandi* to date. The centrist approach seeks to accommodate many viewpoints, perspectives, and values in defining the role and policies of the CGIAR. The centralized approach provides a single focal point for articulating CGIAR positions.

The CGIAR has chosen to speak with a single voice on genetic resources issues in international fora even though the sixteen CGIAR centers have individual and separate legal identities.¹⁴ In recent years there has been strong momentum toward the development of consistent, system-wide policy guidelines and instruments concerning genetic resources. These include the agreements placing germplasm collections under the auspices of FAO, joint statements with FAO specifying the elements of those agreements, and common material transfer agreements.

The CGIAR chair has been formally authorized by the individual centers as its voice in international fora, although the responsibility may be, and often has been, delegated by the chair to the director of the Systemwide Genetic Resources Program. In spite of this ability to speak on behalf of the sixteen centers, the authority to negotiate on their behalf—or for the CGIAR as a whole—has not been granted to anyone. Regardless of who speaks, this places the CGIAR in a particularly difficult position in international fora, where other participants, representing their own countries, expect the CGIAR to have a comprehensive policy, negotiating positions, and the ability to voice opinions on views and proposals presented in such fora. The situation is further complicated by the fact that the governments represented in such meetings are members of the CGIAR, including all of those profiled in this report, and they have great difficulty coming to agreement in current international negotiations.

¹⁴ At present, the chairman of the CGIAR is empowered by all centers to be the spokesperson on genetic resources issues in international fora. A process of consultation among centers through the Systemwide Genetic Resources Program (located in the IPGRI, one of the CGIAR centers) is used to arrive at positions.

In many respects then, since the CG finds itself subject to the same difficulties as its member governments, the difficulty of articulating a unifying CGIAR position is perhaps understandable and even expected.

Within the CGIAR there are various formal mechanisms to address genetic resources policy issues (Technical Advisory Committee, Genetic Resources Policy Committee, Center Directors Committee, Committee of Board Chairs, etc.). However, it is not clear either how such bodies relate to one another or which resulting policy recommendations take precedence, as the bodies may not agree. In this regard, the CGIAR is not always able to extract and present unambiguous information to its members based on the formal mechanisms. The result is sometimes a tendency to diminish the discussion opportunities in CGIAR meetings to address such complex issues.

In spite of these system-level difficulties, centers have on a few occasions put forth a collective position, although these mutually agreed positions cannot be taken as the CGIAR position per se. Centers have also been able to develop internal operational positions around this framework of mutually agreed positions, which provides internal stability to the system and policy cohesion on a day-to-day basis.

The centralized approach of the CGIAR, in all its manifestations, appears to have been moderately successful in revealing positive and negative implications of various positions, but not in constructing a clear and efficient mechanism for determining system positions to be reflected or for mobilizing the weight of the CGIAR behind those positions. CGIAR representatives go to international fora with a high level of expertise and knowledge. They can articulate established policy guidelines and provide technical information. But they have no authority to make concrete proposals, comment critically on government positions, or make any kind of commitment. They do so at the risk of not being able to secure the necessary backing for their statements from the CGIAR as a system. The opportunity to provide leadership and to be proactive is compromised and the ability of the CGIAR to influence its own future is greatly diminished.

Lack of CGIAR authority in external policy formulation can also be attributed in part to the lack of attention to building capacity within the system to meet the current needs for policy research and action in the area of genetic resources. The complexity of the policy issues, and their importance to the functioning and future of the system, have put pressure on all policy-making mechanisms and on those staff who do engage in policy activities and research. But to date there has not been a concomitant marshaling of staff capacity and resources within the CGIAR to meet the needs, even though the importance of the issues to the functioning and future of the system are well recognized. Few staff are devoted exclusively to this effort and most centers have no one who is dedicated to genetic resources policy work. While CGIAR members and donors express deep concerns about international political developments, few are willing to provide any funds to support representation, advocacy, and education in political fora, including within developing countries themselves. This systemic problem, which exists in part because the CGIAR draws funding primarily from aid agencies, has not been discussed publicly or addressed concretely by the system or its centers.

Not all political issues of importance to the CGIAR are played out in international fora. Many, of course, are dealt with nationally. In recent years, as genetic resources issues have become more heated and more complex technically, center staff have become more involved in offering technical information, advice, and opinions to the countries in which they work. Much of this policy-oriented work has been done almost invisibly by research staff, who are well versed in scientific matters though typically without extensive experience or training in policy or political affairs. Unless today's debates evaporate, center staff will face increasing demands and requests for policy-related assistance. Such efforts have the potential of affecting the international debates as well, by helping to inform national policy makers and by helping to create an enabling policy and regulatory atmosphere within countries. For example, national access legislation, which might forestall the creation of a multilateral system, might be mitigated by international agreements, but it can certainly be addressed at the national level first and most effectively. Here, center staff could play a crucial role. Some already do so. The challenge to the CGIAR will be to capitalize on the wealth of talent, expertise, and practical experience that exists in the commodity centers, and to develop and coordinate it for maximum advantage at both the national and international levels.

An effective internationally accepted multilateral system for exchange of genetic resources would address, and even preclude, many of the difficulties mentioned, but it will not be simple, easily affordable, or easily implemented (see previous Chapter). The issues of what crops would be included, what benefit sharing would be required, and how obligations to the system would be agreed upon are not well defined even after much discussion. It is likely that a multilateral system will require a substantial maintenance investment, not a likely scenario in today's funding environment. It will also require a free flow of germplasm. However, developing countries are unlikely to participate if they do not share equally in the benefits arising from the flow of germplasm, a concept that has proven so far to be difficult to operationalize. It would then be difficult to envision how the CGIAR might operate, and continue to conserve and develop genetic resources for the public good, if the international community does not establish a multilateral system rather than assigning ownership and handling all transactions bilaterally. In recognition of the value of such a multilateral system, the CGIAR has formally requested its consideration in national access legislation. FAO has also subsequently endorsed that request.

Thus the stakes for the CGIAR are high in this international policy debate. The CGIAR finds itself increasingly caught up in a genetic resources debate, with resulting restrictive policy initiatives driven not by actual genetic resources issues or concerns but by the new potentials promised by biotechnology and the ability to capture profits through IPRs. CGIAR centers must position themselves simultaneously—with regard to research—as cooperators and collaborators with the powerful private sector and advanced research interests, and at the same time—with regard to genetic resources—as the protectors of past innovators and source countries and as the developers of these resources in and for the public domain. In this environment, it becomes more and more difficult for the centers to work toward their goal of food security and eradication of poverty. The result is a tension between competing interests that has yet to lend itself even tentatively to a workable solution.

Chapter 5

Conclusions

This study emerged from an alarming and growing concern about the progress of international negotiations on issues of genetic resources. The inability of governments to compromise and reach agreement is a very real threat to the continued production of international public goods derived from genetic resources, including conservation itself. As the international stalemate continues, more restrictions to access are being contemplated without a clear vision of their future impact, and often in response to external driving factors, such as the increasing number of patents being granted with wider and wider scope of protection.

The purpose of the study was to clarify issues; to inquire into whether the complexity of the interrelationships among different international fora might contribute to the obscurity of the policy debates on genetic resources at both the national and international levels; and to pinpoint reasons for the paralysis in reaching decisions. To do that, we have reviewed current issues in genetic resources for food and agriculture, analyzed decision making at the national level in selected countries, and drawn from this analysis implications for the conduct of international negotiations and for the future of international agricultural research as it depends on genetic resources. The focus on decision making at the national level was based on the assumption that positions taken by government representatives in various international fora critically depend on the nature, content, and process of policy making at the national level. The study has accomplished those objectives. In the process we have placed the current debate in its historical context and have emphasized the wide range of interpretations of the meanings, uses, and values of genetic resources to different societies and cultures. This provides insights as to the root of the slow progress in international negotiations, both in these social and cultural interpretations and in the way they are manifested in national decision making processes.

One readily apparent explanation of why it has been extremely difficult to reach international consensus is precisely the complexity of the negotiation processes involved. As noted, international negotiations on plant genetic resources take place primarily in the FAO Commission on Plant Genetic Resources for Food and Agriculture. But deliberations in that forum are closely interrelated with negotiations in other international fora, particularly in the Conference of Parties of the CBD and in the TRIPs component of the WTO. Negotiators in these fora are often from different ministries. This need not be a problem in countries well equipped to elevate issues to the level at which ministries can and must interact to remove contradictions and harmonize positions so that they will apply across fora. Sadly, however, that is seldom the case, and the resolution of critical issues eludes negotiators.

A second similarly obvious explanation is the complexity of the issues themselves and the magnitude and scope of differing viewpoints within even a single country. The combination of a complex international negotiation process and a

complex set of issues with tremendous long-term social, economic, and political impact is the perfect setting for a breakdown of international consensus on the issues of genetic resources. Finally, the generality or ambiguity of some of the rules that need to be implemented add to the difficulties governments face at the national level and in international negotiations.

Our review of current issues in this study describes the international debate in terms of the complexity and interrelatedness of these issues. Access, benefit sharing, protection of intellectual property, and Farmers' Rights are at the forefront and continue to be controversial. They cannot be approached piecemeal but require a contextual consensus based on trust and confidence in the feasibility of agreeing on and implementing an international system of equitable sharing of both the costs and the benefits. At the national level, a commitment to the success of such a system—to the extent that national laws are constructed rationally both for the country and for the world—is essential in spite of varying stakeholder views and values.

In our analyses of how selected governments reach such positions and policies, we begin to understand why countries take such different approaches. Internal mechanisms, processes, and stakeholder influence differ widely from country to country and are responsible for directing national decision making toward one position or another. Stakeholder influence is manifested by groups such as NGOs, research organizations, and industrial representatives, and also by the array of government ministries participating. The result is a cacophony of varied interests and levels of power attempting to arrive at a common policy framework. In the process of reaching for that framework at the national level, short-term visions often preclude long-term visions. The resulting policy decisions are often disconnected and fragmented and even sometimes conflicting within a single country. And they have serious implications for the next step of negotiations on genetic resources, which is at the international level.

There the mechanisms, processes and stakeholder influences are much different than at the national level. They revolve around the same issues, but the power and authority with which negotiators operate is largely determined by the forum itself and by the position of the negotiators within the country government structure. For instance, FAO negotiators are largely from the agriculture sector and often have less power, authority, and ability to maneuver than do WTO representatives of the same governments. The fragmentation and internal conflicts in their national policies further hamper them. Taken as a whole over a large number of countries, the failures to reach agreement at the national level impede progress in all relevant international fora toward positions reflecting equitable solutions to the most serious bottlenecks in the development of a functioning and rational international system of conserving and using genetic resources.

Nowhere are the consequences of this lack of development of such a system more acutely felt than in those international organizations producing international public goods based on conserving and using genetic resources. The research centers of the CGIAR are an example. Until agreement is reached that would allow these centers to continue to operate under an umbrella of free and open access, at least of major food and agriculture crops, the ability to produce international public goods is

threatened. This unique role, by definition, will not be assumed by the private sector, nor by the national research institutions in developing countries, nor by any other stakeholders in the debate. At a minimum, the results of this study indicate that all countries would benefit by providing in their national legislation special status for the international collections held in trust and for the benefit of humankind. Such special status would insure that resources continue to be freely available and in the public domain.

We have pointed out the difficulties in reaching international agreement on genetic resources, and we attribute them in large part to the difficulties in determining policy at the national level. We have also pointed out the consequences, which intensify as the debate is prolonged. The maintenance of present yield levels for major food crops will depend on combining many genetic traits found in materials of a wide variety of origins, traits which must be placed into a range of varieties and used in many different locations. Future food security depends on it and international public goods deliver it. Most of all, we emphasize the hazard of potential loss of those international public goods, and the resulting threat to all countries. Thus we hope that this study can contribute to a greater awareness of the current threats and will constitute a call to action for all those who have the power to influence a positive outcome.

Appendix

Legal Issues Relating to Access to Plant Genetic Resources

A number of legal issues may affect the access to and use of plant genetic resources, notably regulations on access to genetic resources and their protection under IPR. The ways in which those issues are dealt with at the national level are likely to condition progress substantially in international negotiations.

In this appendix we examine, first, the current approaches followed with respect to access legislation, and what their implications may be for access to, and utilization of, plant genetic resources, particularly those held in ex-situ conditions. For this purpose, the specific regulations on access so far enacted are briefly studied.

Second, we consider the main trends relating to the appropriation by IPRs and how the granting of such rights may affect access. The interface between access and IPRs legislation is also addressed.

Access Legislation

While recognizing sovereign rights over genetic resources, the CBD has delineated a number of mechanisms to exercise such rights, namely through subordinating access to prior informed consent, mutually agreed terms, and the sharing of benefits. Some countries have started to adopt legislation based on or inspired by the CBD.¹

The principles of the CBD relating to access have been implemented at the national level through different types of regulations. A first category includes general environmental laws (such as those adopted in Australia and several African countries)² which are only “enabling” in nature, in the sense that they charge a competent national authority to examine the issue and provide specific guidelines or regulations in the future.

A second category includes framework laws regarding sustainable development, nature conservation, national parks, sectoral issues, or biodiversity, laws generally containing access provisions more detailed than in the laws in the first group.³ Most laws in this second category establish the principles of mutually agreed terms and prior informed consent for access, in some cases in great detail, such as in the Biodiversity Law of Costa Rica (Law No. 7788 of 1998).

Finally, a third category comprises “dedicated” regulations; that is, those specifically aimed at regulating access to genetic resources. Very few regulations fall within this category: the Philippines Executive Order 247 (1995), Decision 391 of the Andean Group, and the regulations issued to implement said Decision in some of the Andean countries.

Though there are draft regulations in the three mentioned categories under consideration in many countries,⁴ overall the number of countries that have actually

adopted legislation to incorporate the CBD provisions is rather small. The slow pace of implementation of the CBD is in sharp contrast to the speed and depth of changes in the area of IPRs.

This contrast may be explained by the existence of specific terms and mechanisms to ensure compliance with the international standards on IPRs as set forth by the TRIPS Agreement. Strong industrial lobbies (such as the pharmaceutical, software and recording industries) have continuously monitored the process of implementation of the said agreement and pressed for higher levels of IPRs protection, and some governments of developed countries maintain a vigilant attitude, including in some cases direct retaliatory action.⁵ This context substantially differs from the situation in the area of genetics resources, as suggested by the national studies presented in chapter 2. The low number of national regulations specifically dealing with access suggests that social groups interested in genetic resources issues have not been able to get the necessary political support to put forward specific policies on the matter. This may be further complicated by the considerable conceptual and practical difficulties that governments need to face in order to implement the programmatic provisions of the CBD.

The basic provisions of the dedicated regulations as well of other regulations that specifically deal with access (such as the Biodiversity Law of Costa Rica) are quite similar. They generally reaffirm the principle of national sovereignty,⁶ institute prior informed consent procedures, and specify the conditions for granting of permits. Among such provisions, the following are generally found (Byström, Einarsson, and Axelsson Nycander 1999):

- ✂✂ full information about new products and/or knowledge developed from accessed materials,
- ✂✂ priority access to such new products and/or knowledge,
- ✂✂ a share in financial and other benefits accruing,
- ✂✂ obligatory deposit of a specimen of each accession,
- ✂✂ transfer to third parties only after authorization,
- ✂✂ involvement of local scientists in collection/research.

In some cases it is also established that any IPR or other claim to the resource in question shall not be considered valid if it was obtained or used in violation of the terms of the permit. Another common feature of regulations on access is their broad scope: they apply to all genetic resources in all sectors of biodiversity as well as to those maintained in in-situ and in ex-situ conditions. The main provisions of the two dedicated access regulations enacted so far (by the Philippines and the Andean Group) are briefly reviewed later in this appendix.

Dedicated Access Regulations

The Philippines

As noted, there are few regulations that deal specifically with access in accordance with the CBD. The Philippines pioneered the process of incorporating the

CBD principles into national regulations. In 1990 the Philippines government and academic institutions adopted a memorandum of agreement entitled "Guidelines for the Collection of Biological Specimens in the Philippines." The Philippine Network for the Chemistry of Natural Products later drafted a more comprehensive regulation, which provided the basis for enacting in May 1995 the law "Prescribing Guidelines and Establishing a Regulatory Framework for the Prospecting of Biological and Genetic Resources, their By-products and Derivatives, for Scientific and Commercial Purposes, and for Other Purposes" (Executive Order No. 247). This order was implemented by the Department Administrative Order 96-20 ("Implementing rules and prospecting of biological and genetic resources").

Executive Order No. 247 is based on a principle in the Philippines Constitution, which vests in the State the ultimate responsibility to preserve and protect the environment.⁷ State policy on this matter is defined by section 1 of the Order:

"It shall be the policy of the State to regulate the prospecting of biological and genetic resources so that these resources are protected and conserved, are developed and put to the sustainable use and benefit of the national interest. Further, it shall promote the development of local capability in science and technology to achieve technological self-reliance in selected areas."

The Order created a framework to regulate biodiversity prospecting on the basis of prior informed consent from local and indigenous communities, with a system of Research Agreements to be entered into between collectors and the government. The Research Agreements must contain terms concerning the provision of information and samples, technology cooperation, and benefit sharing. The Order established an Inter-Agency Committee on Biological and Genetic Resources to approve and monitor compliance with Research Agreements as well as to coordinate other matters.

The Order covers the "bioprospecting and prospecting"⁸ of biological and genetic resources in all areas as well as of their "by-products and derivatives." The scope and coverage of the regime includes all except traditional use, and all bioprospecting activities aimed at discovering, exploring, or using biological or genetic resources "for pharmaceutical development, agricultural, and commercial applications" (section 3, Administrative Order 96-20).

The prospecting of biological and genetic resources shall be allowed when the person, entity, or corporation—foreign or domestic—undertaking such activities, on recommendation of the Inter-Agency Committee on Biological and Genetic Resources, has entered into a Research Agreement with the Philippines government.

If the research and collection of biological and genetic resources is intended directly or indirectly for commercial purposes, the agreement must be a Commercial Research Agreement. For purposes of the Executive Order, all Research Agreements with private persons and corporations, including all agreements with foreign or international entities, shall conform with the minimum requirements of a Commercial Research Agreement.

If the prospecting of biological and genetic materials is intended primarily for academic purposes, the agreement shall be an Academic Research Agreement. Only duly recognized Philippines universities and academic institutions, domestic governmental entities, and intergovernmental entities may apply for an Academic Research Agreement (section 3). The Order establishes in a detailed manner the conditions for the commercial and academic agreements. Procedures for processing either kind of research agreement involve twelve steps (La Viña, Caleda, and Baylon, 1997).

The rights of indigenous and local communities must be taken into account with regard to informed consent procedures. The Order distinguishes the rights in accordance with the type of community. In the case of local communities, prospecting of biological and genetic resources shall be allowed only with their prior informed consent. Consent is also required from the private land owner of an area where a material is found.

In the case of indigenous communities, the Order specifies that prospecting shall be allowed "within the ancestral lands and domains of indigenous cultural communities only with the prior informed consent of such communities; obtained in accordance with the customary laws of the concerned community."

As described, Executive Order 247 of 1995 mainly targets bioprospecting activities independently from sector of biodiversity concerned, from the scientific or commercial use of the materials collected, and from the activity in which they may apply. Agricultural uses are clearly included, though the Order seems to focus on genetic resources maintained in situ.

The Andean Group

Dedicated access regulations have also been adopted by the Andean Group countries through Decision 391 ("Common Regime on the Access to Genetic Resources," July 1996) and in the implementing legislation adopted in Bolivia (Supreme Decree No. 24.676 of June 21, 1997). Peru has issued for comments a draft regulation on access.⁹

Decision 391 applies to all genetic resources for which one of the Andean Group countries is country of origin,¹⁰ excluding human genetic resources and resources exchanged by local, Afro-American, and indigenous communities among themselves in accordance to their own practices (article 4). It does not apply only to the genetic resources¹¹ as such but also to their derivative products¹² and "intangible components."¹³

Such resources and derivative products are subject to the sovereign rights of member states and are deemed to be "goods or patrimony of the Nation or of the State," according to the legislation of each country. The rights on such resources are, in addition, recognized *sine die*, as inalienable and not subject to seizure, without prejudice to property regimes of the biological resources that contain them, the land on which they are found, or the associated intangible component" (article 6). In accordance with this provision, therefore, Andean countries do not claim "property

rights” in the strict sense over the resources for which they are countries of origin but the right to control their conservation and exploitation.¹⁴

Member countries recognize communities’ rights and the faculty to decide with respect to their knowledge, innovations, and traditional practices associated with genetic resources and derivative products (article 7). Member countries provide each other national treatment. Other countries may also be subject to this treatment, on the basis of reciprocity (article 11).

The common regime provides a detailed mechanism to obtain access.¹⁵ Requests for access need to be registered and published, and any person may participate in the procedures providing information (article 28). Permits conferred and an abridged version of approved contracts should be registered with public registries.

Access is subject to the submission, approval, registration, and publication of a formal request and to the signature of a contract between the competent national authority and the requesting party. The contract should specify, among other things, the “fair and equitable” distribution of benefits stemming from the utilization of the resources (article 35). In addition, conditions relating to the following matters should be included (article 17):

- participation of Andean Group nationals in research activities;
- support of research within the country of origin or subregion and contributing to the conservation and sustainable use of biological diversity;
- strengthening of mechanisms for the transfer of technology and knowledge;
- supply of information on the resources;
- strengthening of institutional capacities and of those of the communities;
- compulsory deposit of samples duplicates; and
- the determination of ownership of eventual intellectual property rights.

The signature of the contract is also subject, where necessary, to the establishment of contracts between the requesting party and the suppliers of the genetic resources (“accessory contracts”). These contracts should determine the conditions for the delivery of material and the fair and equitable sharing in the benefits derived from access. In addition, a contract with a national scientific counterpart needs to be made. This counterpart is obliged to report to and cooperate with the national authority in the monitoring and control of the access granted. Universities, public centers of research, and “recognized researchers” may sign “frameworks agreements” to cover several projects (article 36).

Finally, member countries may establish limitations to access in several cases, based on the endemic character of the resources; the danger of extinction; negative impact on an ecosystem, human health, or “essential elements of the cultural identities of peoples”; risk of genetic erosion; biosafety; or when the genetic resources or certain geographic areas are qualified as “strategic” (article 45).

Scope

The approach of imposing the same provisions for different sectors of biodiversity, as in the CBD, can be traced in the access regulation adopted in the Andean Group. As mentioned, Decision 391 embraces all types of uses of genetic resources, including genetic resources held in ex-situ and in-situ conditions as well as their derivative products and intangible components. The Decision defines ex-situ conditions by exclusion, as those that are not in situ.

Decision 391 defines an ex-situ conservation center (ESCC) as a legal person recognized by the national competent authority (NCA) and conserving and collecting genetic resources and derivatives "outside their in-situ conditions" (article 1). Article 37 of Decision 391 specifically deals with materials held by ESCCs. It establishes two provisions:

- ✍✍ An ESCC carrying out activities "implying access to genetic resources" is bound to enter into access contracts with the respective NCA. This is an obligation imposed on the ESCCs as such, the violation of which may entail administrative, civil, or criminal sanctions (article 47).
- ✍✍ The NCA of an Andean country may enter into contracts with third parties relating to access to genetic resources deposited in an ESCC, when that State is the country of origin of such resources.

As a result of the provisions described, the application of the Andean access regime is based on a distinction between (a) materials for which the intervening State is country of origin and (b) all other materials for which the particular State is not country of origin.

Resources in category (a) may be subject to access contracts to be established between the receiving party and the NCA. In other words, an ESCC does not seem to have the right to provide access to those materials, unless so authorized by an access contract.

According to article 41 of Decision 391, a contract subscribed to by an ESCC with the recipient of a material would constitute an "accessory contract," which "does not authorize the access to the genetic resource or its derivative product." The content of such an accessory contract is subject to the access contract established between the ESCC and the NCA.

It should be noted that, according to article 37, the NCA "may"¹⁶ enter into a contract with a third party, but it is unclear whether the establishment of that contract is obligatory and what the consequences would be for the ESCC and the private party if the contract were not made.

For materials in category (b), for which the particular State is not country of origin, the ESCC can manage and dispose of the materials according to its own rules, since they are not covered under article 3 of Decision 391.

In sum, materials for which an Andean country is country of origin are subject to the regulations contained in Decision 391. The NCA may determine the conditions for access to those materials, even if held by an ESCC. The NCA may enter into

specific contracts with third parties in order to allow access to them but—though this is not quite clearly spelled out—an ESCC may be allowed to do so under a framework agreement with the NCA.

Date of Acquisition

An important question is whether the conditions set forth in Decision 391 would apply to materials for which a particular Andean country is country of origin and that were collected before the enactment of access legislation.

When the CBD was adopted, it created a framework to regulate the access to and use of plant genetic resources held in ex-situ collections acquired after the entry into force of the Convention. As clarified by Resolution 3 of the Nairobi Conference, the question of treatment of plant genetic resources maintained ex situ and acquired before the entry into force of the Convention was left open for further development within FAO.

Despite the distinction made, the CBD does not prevent any country from applying access legislation to materials acquired before the Convention entered into force. Since States enjoy sovereign rights¹⁷ over genetic resources in their jurisdictions, it may be difficult to dispute the States' right to submit future transactions on pre-Convention materials to access regulations.

According to general legal principles, normally new regulations apply only to future acts and do not apply retroactively to acts already executed, particularly when parties have as a result acquired certain rights. However, particularly in areas where the public interest is concerned, legislation may prescribe that even transactions made in the past be subject to the new regulations. Of course, the retroactive application of the law may be challenged when it affects rights already acquired by a party.

Decision 391 has followed a retroactive approach. According to its transitional provisions, it applies to those (persons and institutions) "that possess genetic resources for which Member States are countries of origin" and obliges them to request access to the NCA. Moreover, contracts already entered into between State organizations and third parties and not in conformity with the Decision may be renegotiated or not renewed, as appropriate.

Thus the date of acquisition of the materials by an ESCC seems to be irrelevant for the purposes of the application of Decision 391, since even previous acts may be revised.

Implementing Regulations

The Bolivian regulation and the proposed decree in Peru have been developed under and should comply with the provisions of Decision 391. They should therefore be considered in the framework of the Decision and not as independent instruments.

In relation to ex-situ collections, Supreme Decree No. 24.676 of Bolivia provides that for access to genetic resources held in an ESCC, an accessory contract should be made in order to determine the benefits that would accrue as a result of utilization of the resources concerned (article 35). The contract should establish benefits, the form

and occasion of their distribution, conditions for determining ownership of intellectual property rights, and conditions for the commercialization of results (article 36). “Access framework contracts” may be established—according to article 36 of Decision 391—in order to cover several projects.

The Peruvian draft regulation provides that persons and institutions possessing genetic resources should submit a report on their “technical and legal situation” within twelve months from the date of entry into force of the regulation. It further stipulates that in the case of an ESCC domiciled in the country providing materials originating in Peru, from which new varieties, derived products, and/or intellectual property rights are generated, the Peruvian State should be compensated with 2.5% of the gross profit margin resulting from commercial or industrial use of the resources (article 4).

Implications

Dedicated access regulations, as adopted by Philippines and the Andean Group countries, are based on the “single” approach adopted by the CBD, whereby no distinction is made between types of biodiversity involved. In addition, in the case of the Andean regulation, genetic resources held in situ and under ex-situ conditions are subject to the same substantive provisions, though access to materials maintained ex situ may be facilitated by the establishment of framework contracts with the NCA, without prejudice to the latter’s right to deal directly with third parties.

The broad scope of such regulations is problematic. Conditions for conservation and use of animal, plant, microbial, aquatic, or marine genetic resources vary considerably according to the characteristics of each sector of biodiversity. Likewise, the practices of exchange and appropriation of such resources differ, depending on the availability of the resources, the difficulty or ease of reproducing them, and the presence or absence of market mechanisms for their exchange, among other factors.

Moreover, a particular category of resources may have different uses. Thus, plant genetic resources may be used for research, breeding, food production, and other industrial applications (e.g., pharmaceuticals). The type of intended use may call for different rules, as proposed by some delegations in the course of the revision of the International Undertaking.

Finally, specific rules may be required depending on the mode of conservation (in situ or ex situ), since the conditions for access and the actors involved differ. The treatment of materials held ex situ raises, on the one hand, the question of whether they are or should be subject to the same rules as materials in situ or to a different set of rules.¹⁸ On the other hand, since a large volume of materials is already available in genebanks, another important issue is the date of application of the new regulations; that is, whether these apply only to materials collected before entry into force of the regulations or also to materials incorporated later.

It is important to note that the access regulations reviewed here go beyond the CBD with regard to the conditions for prior informed consent. According to the CBD, access to genetic resources shall be “subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that

Party" (article 15:5). The regulations under review also require that such consent be given by the local communities concerned.¹⁹ Though this additional requirement may increase the burden of gaining access to materials, it is in line with the spirit of article 8(j) of the CBD, which aims at promoting the wider application of knowledge, innovations and practices of indigenous and local communities "with the approval and involvement of the holders of such knowledge, innovations and practices."

So far, only a very small number of commercial permit applications have apparently been processed in countries with dedicated regulations, and a very limited financial benefit, if any, has been obtained. This may be attributed to the complexity of the access procedures, to the possibility still open to companies and institutions of collecting materials in countries without regulation (or lacking enforcement), and to the fact that industry's interest in direct collection agreements may be more limited than expected.²⁰

It should also be noted that the burden regulations impose on the requesting party may be handled without major difficulties by large commercial companies with the professional and financial capacity to deal with complex legal procedures (Byström, Einarsson, and Axelsson Nycander 1999). Such regulations may be particularly burdensome for smaller companies and research institutions, including those domiciled in the country regulating access. In addition, the enforcement problems posed by the application of access legislation cannot be minimized.

In particular, the implications of access legislation may be significant for international CGIAR centers holding ex-situ collections in the jurisdiction of any of the countries that submit such collections to access rules. National regulations should take into account the agreements made to set up the particular center as well as the 1994 agreements between FAO and the CGIAR centers as regards plant genetic resources.

The Interface between Access and IPR Regulations

While IPRs, especially patents, confer exclusive rights with respect to the protected subject matter, including in many countries genetic materials as such, access regulations establish conditions for the collecting of materials and for their subsequent use for commercial or research purposes. These regulations may lead to inconsistent or contradictory solutions, depending on which rules prevail. Many studies and reports have examined, in particular, the relationship between the CBD and the TRIPS Agreement (Correa 1999; Dutfield 1999).

Three main issues have been raised in this context: the appropriation of genetic resources under IPRs; possible limitations on access to materials protected by IPRs; and the recognition and protection of traditional knowledge. Following is a brief review of these issues and a description of proposals made by some developing countries to reconcile the TRIPS Agreement with the CBD.

Appropriation of Genetic Resources Through IPRs

A possible conflict between IPRs and the CBD principles—including sovereign rights over genetic resources—may arise when there is appropriation by means of

patents or other rights of genetic resources or items of communities' knowledge, as illustrated by the patents granted with respect to turmeric, the neem tree, the Bolivian *quinoa*, the Amazonian *ayahuasca*, and many other materials useful for agriculture or medicine. Patenting of such materials has been facilitated in the US by a novelty requirement lower than the requirement applied in Europe and most other countries.²¹

The adoption of access legislation has been prompted by the desire of some developing countries to protect biological resources, to prevent abuses, and to obtain compensation from commercial use by third parties. As noted in a recent report, even though it is never directly mentioned in the texts, a strong driving force behind these new laws has also been the proliferation of IPRs on genetic resources:

Bluntly put, access regulation is the tool offered by the CBD to countries providing genetic resources for self-defense against IPR claims. Regulated access creates the leverage necessary to set some conditions for the downstream use of their biodiversity. In other words, it opens a possibility of achieving a different balance of benefits between IPR holders and countries of origin. (Byström, Einarsson, and Axelsson Nycander 1999)

The need to develop an interface between access and IPR regulations, in order to avoid biopiracy and the infringement of access regulations, has been taken into account in some countries via limitations to the IPR protection of genetic resources, the establishment of special conditions for the application and granting of IPRs relating to biological materials, or the provision of compulsory licenses.

Limitations to the protection of genetic resources as such have been established in the patent laws of many developing countries, such as Argentina, Mexico, Brazil, and the Andean Group countries (Correa, in press). In the Andean Group countries, and particularly in Colombia, moreover, in order to protect biodiversity from appropriation, newly discovered plant varieties are not protectable under Plant Breeders' Rights (Patiño 1998).

The Costa Rican Biodiversity Law recognizes "the existence and validity of forms of knowledge and innovation and the necessity to protect them by means of the use of legal mechanisms appropriate for each specific case"; but it excludes from any kind of intellectual property protection (including community intellectual rights) the following:

- sequences of deoxyribonucleic acid;
- plants and animals;
- non-genetically modified microorganisms;
- essentially biological processes for the production of plants and animals;
- natural processes or cycles;
- inventions essentially derived from knowledge associated with traditional or cultural biological practices in the public domain; and

inventions that if commercially exploited through a monopoly can affect farming or fishing processes or products considered basic for the food and health of the inhabitants of the country (article 78).

The establishment of special conditions for the application and granting of patents or PBRs is another approach used to create an interface between IPRs and access regulations. Decision 391 stipulates that member countries shall not recognize intellectual property rights over genetic resources, or their derivatives or associated intangible components, when access took place in contravention of the common regime. The affected member country can request cancellation of titles granted (Supplementary Provisions, No. 2).

In addition, national offices competent in the area of intellectual property rights shall require proof of the approval and registration of an access contract, if they have reason to believe that the products or processes for which protection is sought have been obtained or developed on the basis of genetic resources under the jurisdiction of member states.

For inventions that “involve biodiversity elements,” the Costa Rican law provides for mandatory consultation with the offices in charge of granting patents and PBRs and requires proof—based on of a “Certificate of Origin”—that prior informed consent has been obtained (article 80).

Of course, these legal requirements and limitations may only prevent the granting of intellectual property rights or lead to their cancellation in the country where the requirements or limitations were established. Given the territoriality and independence of patent rights and PBRs, such requirements would have no effect in other countries, unless similar requirements or limitations exist. Thus a patent on a certain material may be rejected or cancelled in an Andean country or Costa Rica, but this would not affect the validity of patents or PBRs obtained in other countries.

Finally, in Costa Rica, IPRs granted on subject matter involving biodiversity shall be subject to a compulsory license for the benefit of the State in the case of a declared national emergency, without payment to the title holder (article 81, Biodiversity Law).

In the Philippines, in the case of endemic species, Research Agreements must contain a statement that the technology will be made available to a designated Philippines institution and can be used commercially and locally without payment of a royalty (section 5.I of the Executive Order No. 247).

Limitations to Access

Another issue that has generated concern is the impact that the appropriation of genetic materials under IPRs, where admitted, may have on access to such materials for further research and development. That concern has been accentuated by the expansive application of IPRs, particularly patents, to living organisms and by the possibility available in most industrialized countries of patenting genes and any subcellular part of plants as well as patenting plant cells, plant varieties, and species.

While granting of PBRs does not limit the use of the protected material as a source of research and breeding (due to the generally accepted “breeders’ exemption”), opinions diverge on the extent to which patents on genes may block further use of the material. A critical point is whether a patent would prevent a third party from developing by conventional breeding methods a variety that includes and expresses a patented natural gene. Some experts are of the opinion that patents on genes protect the patent holder “against use of the gene by another biotechnologist, but leave anyone free to use and breed with organisms containing the gene naturally” (Barton 1997). Others, however, fear that neither genes nor plant varieties will be available for further development without the consent of the holders of intellectual property rights (Miranda Santos and Lewontin, 1997).

The way in which this issue is resolved may have a significant impact on the feasibility and operation of a multilateral system of facilitated access to plant germplasm, based on the principle of state sovereignty over genetic resources (Correa 1999).

Traditional Knowledge

The need to develop some form of protection for communities’ knowledge has gained growing recognition in the 1990s. Adoption of the CBD gave impetus to this idea by establishing in article 8(j), as mentioned, the obligation to “respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity.”

Many approaches and proposals have been developed to deal with communities’ knowledge, ranging from the creation of new types of IPRs to the simple option of legally excluding all forms of appropriation on such knowledge, be it under patents, breeders’ rights, or other modalities of IPRs.

Only a few countries have so far started to address the complex conceptual and operational problems involved in the recognition of communities’ rights on their knowledge.

One step in that direction is the requirement in the dedicated access regulations examined here of communities’ consent as a condition for providing access to genetic resources found in their territories. Those regimes do empower the communities to participate in the process of admission of access requests but do not to create any type of rights in the knowledge or materials under the communities’ control.

A few countries have moved farther. In Ecuador a law approved in September 1996 declares that the State holds “property rights over all species” constituting the country’s biodiversity. Such species shall be deemed “national goods of public use” and shall be subject to “special regulations to be decreed by the President of the Republic, guaranteeing ancestral rights of indigenous communities over intangible knowledge and components of biodiversity and of genetic resources and control over them” (article 1). The Constitution of Ecuador (1998) further recognized “collective intellectual property rights” on communities’ ancestral knowledge (article 84). The

Costa Rican Biodiversity Law established a legal concept of community intellectual rights and provided for a voluntary registration system:

The State expressly recognizes and protects, under the common denomination of sui generis community intellectual rights, the knowledge, practices and innovations of indigenous peoples and local communities related to the use of components of biodiversity and associated knowledge. This right exists and is legally recognized by the mere existence of the cultural practice or knowledge related to genetic resources and biochemicals; it does not require prior declaration, explicit recognition nor official registration; therefore it can include practices which in the future acquire such status.

This recognition implies that no form of intellectual or industrial property rights protection regulated in this chapter, in special laws and in international law shall affect such historic practices. (article 82)

Moreover, under the Costa Rican Biodiversity Law any preexisting community rights shall absolutely prevent any grant of PBR or patents on the same subject matter.

Some draft laws also propose the recognition of communities' rights, though in many cases the scope and extent of such rights is not well determined. For instance, in Brazil, Federal Senate Bill No. 306 of 1995 has stated the right of indigenous and local communities to benefit collectively from their traditions and knowledge and to be compensated for the conservation of genetic resources through IPRs or other mechanisms. It also stipulates that no individual intellectual property rights, whether granted inside or outside Brazil, will be considered valid if they are based on collective knowledge of local communities. The Organisation of African Unity model law proposes an explicit recognition of communities' intellectual rights, through a specific registration system, as well as the right not to allow access to the resources and knowledge under their control when access may threaten the integrity of their natural or cultural heritage.

Toward a Review of the TRIPS Agreement?

Several proposals aimed at developing the interface between the TRIPS Agreement and the CBD have been made for a possible review of the TRIPS Agreement. In some cases these proposals are considered part of the built-in agenda for the review of article 27.3(b) of the Agreement. The African Group has indicated, in particular, that the said article should be harmonized with the CBD,²² the objective of which is "to protect the rights of indigenous people and local farming communities and to protect and promote biological diversity." The proposal of the African Group is, so far, the only one to demand that such harmonization also be made with regard to the FAO International Undertaking on Plant Genetic Resources, which "seeks to protect and promote farmers' rights and to conserve plant genetic resources." The group argues that "by mandating or enabling the patenting of seeds, plants and genetic and biological materials, Article 27.3(b) is likely to lead to appropriation of the knowledge and resources of indigenous and local communities" (WTO Reference Document WT/GC/W/202).

India has noted that while the TRIPS Agreement obliges members to provide product patents for microorganisms and for nonbiological and microbiological processes, and to provide for the protection of plant varieties, the CBD "categorically reaffirms that nation states have sovereign rights over their own biological resources, recognizes the desirability of sharing equitably the benefits arising from the use of these resources as well as traditional knowledge, innovations and practices relevant to the conservation of biological diversity and its sustainable use, and acknowledges that special provisions are required to meet the needs of developing countries."

In order to reconcile any contradictions, India suggested that the innovators share with holders of traditional knowledge the benefits arising from its exploitation, through "material transfer agreements/transfer of information agreements":

A material transfer agreement would be necessary where the inventor wishes to use the biological material and a transfer of information agreement would be necessary where the inventor bases himself on indigenous or traditional knowledge. Such an obligation could be incorporated through inclusion of provisions in Article 29 of the TRIPS Agreement requiring a clear mention of the biological source material and the country of origin. . . . This part of the patent application should be open to full public scrutiny on filing of the application. This would permit countries with possible opposition claims to examine the application and state their claims well in time. At the same time domestic laws on biodiversity could ensure that the prior informed consent of the country of origin and the knowledge holder of the biological raw material meant for usage in a patentable invention would enable the signing of material transfer agreements or transfer of information agreements, as the case may be. Such a provision in the domestic law should be considered compatible with the TRIPS Agreement. The suggestion basically asks for further transparency in the form of additional information in patent applications, and an approach which allows a harmonious construction of the two international agreements. (WTO Reference Document WT/GC/W/147)

For the purposes of achieving a harmonization of the TRIPS Agreement with the CBD, India has concretely proposed to incorporate a provision establishing that patents inconsistent with Article 15²³ of the CBD must not be granted (WTO Reference Document WT/GC/W/225).

This proposal may be expanded to cover other IPRs, such as breeders' rights. It may also be useful to specify the novelty requirement in a manner that excludes the protection of any subject matter which was made available to the public by means of a written description, by use, or in any other way in any country²⁴ before the date of filing, including use by local and indigenous communities, or by deposit of a material in a germplasm bank or other deposit institutions where the said material is publicly available.

The harmonization of the TRIPS Agreement with the CBD,²⁵ including through the review of article 27.3(b), may provide the basis for developing rules for the protection of traditional knowledge²⁶ in accordance with some of the proposals mentioned.

The approaches followed in the different proposals on traditional knowledge differ significantly. India's concern seems to focus on avoiding the misappropriation of traditional knowledge and on the implementation of the principle of sharing benefits. The African Group seems to aim at preserving the room existing at the national level to legislate on the matter, while Venezuela²⁷ proposes binding international rules "to establish on a mandatory basis within the TRIPS Agreement a system for the protection of intellectual property, with an ethical and economic content, applicable to the traditional knowledge of local and indigenous communities, together with recognition of the need to define the rights of collective holders" (WTO Reference Document WT/GC/W/282).

However, given the considerable ongoing debate on this issue at the national level, it does not seem feasible to reach international consensus rapidly on the objectives, scope, and content of the rights to be recognized in relation to traditional knowledge.

A possible approach may be to aim at the development of a misappropriation regime; that is, of a system not based on the granting of an exclusive right, as in the case of trade secrets. Protection may only ensure the right to prevent the acquisition or use of traditional knowledge in a manner contrary to legitimate rules and practices on access. Hence this right should not prevent any third party (or another community) from using the protected knowledge if it is independently developed or otherwise legitimately obtained.

Summary

A number of legal issues encompassing complex conceptual and operational problems are likely to affect progress in the international agenda on plant genetic resources.

Based on the broad scope of the CBD, national access regulations so far enacted include all types of genetic resources, ignoring the significant differences in various sectors of biodiversity as regards the rationale for and the modes of conservation and exchange of genetic resources. Moreover, access regulations generally cover genetic resources under in-situ and ex-situ conditions, in some cases without distinguishing them—as the CBD did—according to the date of collection of materials held ex-situ.

The number of access regulations enacted so far is very limited, indicating lack of political support for implementing the CBD at the national level and underscoring the considerable difficulties that governments face in operationalizing the CBD programmatic rules. The issue of protecting traditional knowledge and determining the methods for sharing of benefits exemplifies the complexity of matters to be addressed.

The expansive application of IPRs in the biological field in developed countries, with its possible implications for access to genetic resources, further complicates the

matter. While some countries have started to address the interface between access and IPR regulations at the national level, for some developing countries there exist contradictions that call for a substantive review of the TRIPS Agreement within the WTO. Such a review has not been regarded as a condition for advancing the international agenda on genetic resources, but it may certainly slow down the pace of negotiations in other fora.

Notes to Appendix

¹ Since the entry into force of the CBD, more than 30 countries have drafted and/or enacted new legislation regulating access to genetic resources (Glowka 1999). With only a few exceptions, these are all developing countries. The categorization presented here is partially based on Glowka 1999.

² For instance, the National Environment Management Act, 1994 (Law No. 13/94) of Gambia empowers the competent national authority to prohibit or restrict any trade or traffic in any component of biological diversity (article 32.g). It contains a specific provision (article 35) on access to genetic resources, according to which "the genetic resources of the Gambia shall constitute an essential part of the natural wealth of resources of the people of the Gambia." A council created by the law may make regulations and prescribe guidelines regarding access to the genetic resources of the Gambia, including (a) measures regulating the export of germplasm; (b) measures for sharing of benefits derived from germplasm originating from the Gambia; and (c) fees to be paid for access to germplasm.

³ For example, in Cameroon, Law 94/01 of 20.1.94 sets forth rules for integrated management, conservation, and sustainable utilization of forests, fauna, and fisheries. It provides that the genetic resources of Cameroon belong to the State. Nobody is allowed to exploit them for scientific, commercial, or cultural purposes without authorization. The financial or economic benefits resulting from their utilization are subject to a royalty to be paid to the State, at a rate and upon modalities of payment to be determined by the minister of finance on the basis of proposals by the competent ministers (article 12).

⁴ The Organization of African Unity has also prepared draft model legislation covering access and community rights.

⁵ As illustrated by U.S. actions under the "Special 301" section of the U.S. Trade Act.

⁶ In some cases, moreover, the State is declared as "owner" of all genetic resources under its jurisdiction.

⁷ The Constitution further provides that wildlife, flora and fauna are owned by the State and that the disposition, development, and utilization thereof are under its full control and supervision.

⁸ These are defined as "the research, collection and utilization of biological and genetic resources, for purposes of applying the knowledge derived therefrom for scientific or commercial purposes" (Administrative Order 96-20).

⁹ The Peruvian government has also published (for comments) a proposal on traditional knowledge (*Diario Oficial El Peruano*, 21 October, 1999).

¹⁰ The "country of origin" is the country that possesses genetic resources in in-situ conditions, including those taken from in-situ sources and now found ex situ.

¹¹ These resources are defined as "any material of biological nature that contains genetic information of actual or potential value or utility" (article 1).

¹² These include molecules and a combination or mixture of natural molecules (article 1).

¹³ Which are defined as any knowledge, individual or collective innovation or practice, with actual or potential value, associated with a genetic resource, with derivative products, or with the biological resource that contains them, protected or not by intellectual property regimes (article 1).

14 In Ecuador, however, a law approved in September 1996 declares that the State holds "property rights over all species" that constitute the country's biodiversity. Such species shall be deemed as "national goods of public use," and shall be subject to "special regulations to be decreed by the President of the Republic, guaranteeing ancestral rights of indigenous communities over intangible knowledge and components of biodiversity and of genetic resources and control over them" (article 1).

15 Access procedures apply independently from the nationality or domicile of the requesting party.

16 The Spanish text reads *podrá*, which can be translated as "may," indicating the possibility of celebrating a contract, at the discretion of the NCA; or as "can," so as to indicate that the NCA is empowered to do it.

17 It should be recalled that article 3 of the CBD simply recognizes, and does not create, such sovereign rights.

18 Such as those agreed upon in the agreements between FAO and CGIAR centers.

19 The Biodiversity Law of Costa Rica, the draft Brazilian bill, and the OAU model law state the right of communities to refuse any collection or access to genetic resources or traditional knowledge under their domain.

20 Thus, the opportunities opened by the "genomics revolution" and by the exploitation of already collected materials and knowledge may limit the interest of pharmaceutical companies in undertaking bioprospecting activities. Similarly, breeders have access to a rich pool of germplasm existing in ex-situ collections (Ten Kate and Laird 1997).

21 According to the U.S. Patent Law, the disclosure outside the United States of information in a nonwritten form (e.g., by use) does not destroy novelty, and therefore a patent can be granted if the other patentability requirements are met.

22 This group also noted that the early review of article 27.3(b) in 1999, if made, would preempt the outcome of deliberations in other fora, such as CBD, UPOV, and FAO, and therefore proposed to extend the deadline (31.12.99) for implementation of the said provision at the national level.

23 This article requires prior informed consent for access and to share benefits with the country of origin of the material obtained.

24 According to U.S. law, disclosure made outside the United States by means other than a publication does not destroy novelty.

25 See also the submission by Egypt, WT/GG/W/136.

26 See in particular the submissions by India and by the African Group.

27 Under Decision 391 of the Andean Pact, the member countries are bound to develop legal regimes for the protection of communities' knowledge. A constitutional provision to that effect has been adopted in Ecuador. None of the Andean countries, however, have so far developed such regimes.

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