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## ***Ownership of Biodiversity: A Developing Country's Perspective on an Open International Debate***

Jose`Luis`Solleiro

*Senior Researcher*

*Centre for Technological Innovation*

*National University of Mexico*

*Mexico City, Mexico*

The life sciences are changing at a rapid rate in their fundamental character. These changes are of two principal kinds. First, tremendous technical advances have been realized over the past couple of decades. It is now possible and, indeed, is common practice to transfer genetic material between completely dissimilar organisms. It is also possible to isolate and multiply for commercial use parts of organisms to, for example, mass-produced chemicals that are otherwise produced in much smaller quantities by plants. The second change, intimately connected with these scientific breakthroughs, is a strong and escalating trend toward the commercialization of the life sciences (Belcher and Hawtin 1991).

As a consequence, since the mid-1980s, the main industrialized countries have started international negotiations to encourage (or to force) the rest of the world to reduce unauthorized diffusion of new technologies. The risk of having their intellectual property pirated elsewhere would deter companies from exporting their products and technologies. It was concluded that the absence of strong intellectual property protection performs as an effective trade barrier (Jaffe and van Wijk 1995).

In this context, the protection of biological innovations was introduced in the GATT (General Agreement on Tariffs and Trade) talks around 1990, and has become the subject of specific provisions in the final agreement. In this way, an actual requirement for membership in the World Trade Organization, according to the Uruguay Round of GATT, is full adoption of the agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs). TRIPs sets

international standards for protection. Patents shall be available for any inventions in all fields of technology. Excluded from patent protection may be plants and animals other than microorganisms, and essentially biological processes for the production of plants and animals, other than nonbiological and microbiological processes. However, protection for plant varieties shall be provided either by patents or by an effective *sui generis* system or by any combination thereof (GATT 1994).

TRIPs has brought some peace of mind to those promoting stronger protection of intellectual property rights for biological innovations. But a concern remains: The access to genetic resources and the possibility of adopting a certain degree of control over these resources through different types of ownership. Although considerable progress has been made in developing an international framework for the conservation, use and access to plant genetic resources, it is still unclear if plant genetic resources are subject to ownership. It is also unclear to what extent developing countries, where an important part of biodiversity concentrates, can make actual profits from sovereign rights contemplated in the Convention on Biological Diversity. This paper presents a perspective from the South to these questions.

#### From "a Free Flow System" to "Sovereignty"

During the 1970s, the United Nations Food and Agriculture Organization (FAO) Commission on Plant Genetic Resources was established as an intergovernmental policy forum. Although the FAO's involvement in genetic resources dates back several decades, it was in 1983 that member governments established the International Undertaking on Plant Genetic Resources. The Undertaking is a nonbinding agreement to cooperate in the conservation of genetic material and to work together for its sustainable development. Regarding the ownership and control over plant genetic resources, the Undertaking declared all germplasm, including breeders' lines and elite varieties, as common heritage. Most developing countries, and many developed countries, adhered to the Undertaking, but it had no legal standing. The U.S. did not adhere to the Undertaking, even after the modifications made later (Menon 1995).

Major changes concerning access to genetic resources have been taking place within the Commission. As mentioned before, according to the 1983 FAO International Undertaking on Plant Genetic Resources, common heritage meant free access. Article 5 of the Undertaking stated that adhering governments and institutions will make genetic resources under their control available "free of charge, on the basis of mutual exchange or on mutually agreed terms." In 1989, the Undertaking was modified through the FAO resolution 4.89 on an agreed interpretation of the Undertaking including a recognition of breeders' rights and farmers' rights, and resolution 5.89 on farmers' rights. Resolution 4.89 clearly stated that the term "free access" did not mean "free of charge." The

last FAO conference, held November 1991, discussed another amendment to the Undertaking that endorsed "that nations have sovereign rights over their plant genetic resources and that breeders' lines and farmers' breeding material should only be available at the discretion of their developers during the period of development."

"In other words, in less than a decade, the position had taken a 180 degree turn" (Menon 1995). This constitutes the first international agreement to recognize States' sovereign rights with respect to plant genetic resources, as clarified by resolution 3.91. Under these last provisions, countries adhering to the Undertaking agreed to confer access to the samples of genetic materials under their control only for specific purposes, e.g., scientific research, plant breeding or conservation. This clearly excludes access with an aim to reproducing the materials for commercial purposes, such as for propagating seeds (Correa 1994).

Plant Breeders' Rights, as provided for under UPOV (International Union for the Protection of New Plant Varieties) are not incompatible with the Undertaking. No reference is made regarding the compatibility of the Undertaking with the patenting of plant genetic resources. The granting of patent rights implies the restriction on the access to protected materials greater than in the case of breeders' rights. The compatibility of the Undertaking with patent rights is likely to be discussed in the framework of the ongoing process of the FAO Commission on Plant Genetic Resources. "Divergence's of opinion may be anticipated, since many developing countries seem to view patenting of plants and plant varieties as incompatible with a policy of development and sustainable use of plant genetic resources" (Correa, 1994).

#### **The Convention on Biological Diversity. From Recognition to a New**

The Convention on Biological Diversity was adopted at the Earth Summit in Rio de Janeiro, in June 1992, which was organized to address a broad range of environmental problems. The Convention represents an attempt to balance the interests of the gene-rich South with those of the gene-poor but technology-rich North. In December 1993, the Convention became, unlike the FAO's International Undertaking, a legally binding framework for conserving and utilizing global diversity. It recognizes "national sovereignty" over all genetic resources, as well as the need to compensate developing nations for the resources that they have historically donated to the development of the world's agriculture.

The Convention represents an agreement that grants access to those resources in exchange for compensation and access to technology. Article 1 of the Convention describes its objectives. They include conservation of biological diversity, sustainable use of its components, fair and equitable sharing of the benefits arising out of the utilization of genetic resources, through (Siebeck 1994):

Appropriate access to genetic resources;

Appropriate transfer of technologies (taking into account all rights over those resources and to technologies); and

Appropriate funding.

Article 3 of the Convention affirms that States have the sovereign right to exploit their own resources pursuant to their own environmental policies. Article 15 addresses access issues and states that the authority to determine access to genetic resources rests within the national governments and is subject to national legislation. This is elaborated as follows (Mugabe and Ouko 1994):

States shall facilitate access for environmentally sound use;

The access shall be subject to prior informed consent and based on mutually agreed terms; and

The Convention provides for the sharing of benefits derived from genetic resources with the country of origin, or the country providing such resources, if required in accordance with the convention.

The right of access by other contracting parties is, thus, dependent upon the conditions established by the legislation and competent authorities of each country. It is also subject to the country's prior consent, provided further that "mutually agreed terms" are reached between the parties. This effectively implies that future transfers of genetic resources will be made under material transfer agreements designed to protect source nations' interests in any resulting profits. Under the compromises of the Convention, this international sovereign right applies only to genetic resources possessed in *in sui* collections. Resources already outside the nationals as in international repositories, are not subject to such rights (Barton 1994).

Another obligation assumed by contracting parties is to provide . . . in "the case of technology subject to patents and other intellectual property rights . . ." for an "adequate and effective protection" of said rights (Article 16). This article may be read as requiring the patentability of genetic resources, but only defines the conditions of protection if and when such a protection is conferred (Correa 1994).

An obligation is also stated for recipients of genetic resources to allow and facilitate access to technologies on mutually agreed terms and limited to technologies derived from the use of genetic resources. Intellectual property protection, as contemplated in Article 16, limits release of technology. There are no provisions for compulsory licensing (Siebeck, 1994). In this way, "the Convention, in a provision that is carefully balanced but lacks clear logic, also defined a developed-world duty to transfer technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources. This is to be done in a way consistent with the adequate and effective protection of intellectual property rights" (Barton 1994).

This contradiction regarding the access of developing countries to technologies of developed countries may have profound implications for the former. According to Walter Jaffe (1994), biodiversity offers interesting possibilities for introducing new biotechnologies and investments from the North, but to capitalize these possibilities developing countries require substantial and sophisticated scientific and technological resources. Unless developing countries rapidly create such capacities, the exchange with the North will take place in a very inequitable way, preventing access by developing countries to the technologies they require for sustainable use and conservation of their resources.

The financial needs of the Convention will be subscribed to primarily by the developed countries. These are to meet developing country expenses on conservation, as well as their access to technology. They could be drawn upon to pay for royalties. It seems quite wishful to assume that Global Environment Facility funds, created for this purpose, will be enough to enable developing countries to access the technologies they need to achieve the general objectives of the Convention.

It is therefore hard to imagine how national sovereignty over genetic resources can be implemented in countries that lack the legal infrastructure and, even more critical, that are not even aware of the diversity, quantity, location and potential of these resources. Accepting that it has been a major step for developing countries to get international recognition of the sovereignty and compensation for the value of biological resources, it is essential to keep working to improve the legal framework to deal with these issues at all levels and to build domestic capacities to identify conserve and use genetic resources and better negotiate the terms of future agreements.

For the latter objective, it seems essential for developing countries to monitor experiences like the famous Merck-INBIO agreement. Under this deal, INBIO agreed to inventory and supply samples of plants, microorganisms and animals collected from the Costa Rican rain forests over a period of two years. The contract gave Merck & Co., Inc., the exclusive rights to screen, develop and patent new products from these resources. In return, Merck agreed to pay INBIO one million dollars and share five percent of the royalties arising from the sale of products derived from these biological materials. This agreement drew criticism from many different writers and policy analysts. The main criticism has been directed at the fact that INBIO is a private organization and therefore had no rights to lay claims to what is seen as national heritage (Menon 1995). Nevertheless, the agreement constitutes a first attempt to solve the problem of implementing effective economic compensation for access to the genetic resources of the South.

Another interesting example comes from another drug company, Shaman Pharmaceuticals. The company announced its intention to return a percentage of profits back to all countries and communities it has worked with after

any product is commercialized. Compensation will be funneled through the Healing Forest Conservancy, a nonprofit organization founded by Shaman for the conservation of biodiversity and the protection of indigenous knowledge. Shaman's research has already led to some patents. The company recognizes that the resulting royalties are based upon its own contribution and that of the communities from whom it received medicinal plants. The company has developed contracts with some indigenous communities in Latin America. However, it could be some time before it will be possible to determine the benefit of the arrangement for the communities involved (Crucible Group 1994).

These two cases do not constitute models for developing countries to follow, but they have the merit of pioneering an non-exploited field. In my opinion, the worst position to adopt before the possibility of negotiating material transfer agreements of this nature is the paralysis from analysis. Some institutions from developing countries are losing real opportunities because of their passive attitudes and the fear of losing the "treasure of biodiversity." This attitude shows that these institutions are forgetting a basic mathematical truth: a small percentage of something is always greater than 100 percent of nothing.

#### **Recognition of Farmers' Contributions to Biodiversity and Agricultural Technology**

Since the early 1980s, a part of the South-North controversy over genetic resources has centered on questions of equity in the distribution of benefits arising from the use of plant genetic resources. On one hand, developing countries have questioned the fairness of assigning intellectual property rights to those who breed new plant varieties, while the work of farmers who have generated the plant diversity that constitutes the basis for modern breeding is not legally recognized. On the other hand, industrialized countries have stressed that plant breeders' rights and patents are not a form of compensation but rather an incentive for innovation (Jaffe and van Wijk 1995).

The contribution made by generations of farmers to the conservation of germplasm and the improvement of species has been recognized by the international community, particularly under the FAO International Undertaking on Plant Genetic Resources and the Convention on Biological Diversity. Indeed, the dispute was partly resolved when, within FAO, the rights of farmers in developing countries were acknowledged in order to counterbalance the plant breeders' rights granted in industrialized countries. Farmers' rights were defined as rights arising from contributions of farmers in generating plant genetic resources, particularly in the centers of diversity, and have the purpose of ensuring full benefits to these farmers and supporting the continuation of their contributions (FAO 1989). An International Gene Fund would be created to give a concrete and substantial basis to the farmers' rights.

But even when the farmers' contribution to agricultural innovation is widely recognized<sup>1</sup>, the way of compensating this contribution remains in the dark. The International Gene Fund failed to materialize, although it had the merit of bringing the issue to the international political agenda. The concept was further discussed during the Keystone International Dialogue on Plant Genetic Resources (Keystone International Dialogue on Plant Genetic Resources 1991), and during the Earth Summit on Environment and Development in 1992. The Convention, however, follows the principle of national patrimony and recognizes sovereign rights of States (Jade and van Wijk 1995). According to Menon (1995), it is essential to recognize not only the sovereignty but also the result of the work of many generations of peasants as a common contribution to innovation. For this reason, the implementation of FAO's farmers' rights concept should be given greater attention as a source of ideas to materialize the compensation to farmers.

Such rights were not conceived by the FAO Conference as an exclusive right, but as a right to obtain compensation (Correa, 1994). This fits the situation in which the rights are attributed not to individuals but to a collective entity, and to cases in which the administration of the remuneration is administered by a collective organization.

An example of implementation of farmers' rights at the national level is contained in a draft law on plant varieties protection under review in India. According to this document, a National Community Gene Fund would be established. Its funding would be partly supplied by a royalty paid by the seed industry, based on the sales of protected varieties. The funds would be used in trust of Indian farmers for collecting, evaluating, upgrading, conserving and utilizing genetic diversity.

This approach at the national level is certainly an important step, constituting a collective compensating system with impacts in the long run on farmers' communities. However, the collective mechanisms do not solve the problem of compensating farmers at the global level, given the global nature of the values of germplasm farmers provide (Correa 1994).

Internationally, it is essential that intergovernmental negotiations address the creation of a mandatory funding mechanism to recognize, reward and protect the contributions of local communities, farmers and indigenous people (Shand 1993). It has to be understood, however, that such a task will demand a change in the attitudes of negotiators, a greater amount of good will, and a lot of creativity.

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<sup>1</sup>In a recent survey conducted by the author, managers of Mexican seed companies were interviewed and their answer to an explicit question about the contribution of land races to their breeding programs states clearly the essential role of these resources. Company managers also agree that it is important to recognize farmers' contributions and even compensate them economically, but there is no agreement or new ideas on the way to do that.

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