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**BEYOND THE BIODIVERSITY
CONVENTION**

A View From India

Ashish Kothari
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Public Administration
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**International Conference on
the Convention on Biological Diversity:
National Interests and Global Imperatives**

**Held at the United Nations Environment
Programme (UNEP) Headquarters
Nairobi, Kenya**

January 26-29, 1993

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African Centre for Technology Studie

**LEGAL QUESTIONS CONCERNING
THE IMPLEMENTATION OF
ARTICLE 15 PARAGRAPH 5
OF THE CONVENTION ON
BIOLOGICAL DIVERSITY**

Access to Genetic Resources

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and

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**International Conference on
the Convention on Biological Diversity:
National Interests and Global Imperatives**

**Held at the United Nations Environment
Programme (UNEP) Headquarters
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THE CONTEXT OF GLOBAL
ENVIRONMENTAL ISSUES**

Amrita N Achanta
Research Associate

and

Prodipto Ghosh
Senior Fellow
Tata Energy Research Institute
Jor Bagh, New Delhi

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Abstract

This paper attempts to analyze the implications for and considerations involved in technology transfer, which is a crucial component of both the Conventions on Biological Diversity and Climate Change. The protection, offered to technologies by various forms of Intellectual Property Rights, dictates the extent and manner in which an external agent may transfer technology; while developed countries consider IPRs as a significant barrier to effective technology transfer. This paper stresses the viewpoint of the developing world; commencing with the major concerns regarding IPRs, the appropriateness of potential technology to be transferred, scope of protection offered by IPRs, and what aspects need inclusion in future agreements /protocols so as to protect the interests of the developing world.

1. Introduction

Multilateral regulation of the global environment is sought to be accomplished through Conventions and Protocols (for example, the Conventions on Climate Change and Biodiversity adopted at Rio in June 1992, and the earlier Montreal Protocol on Ozone Depletion, 1990). It involves two broad classes of technology transfer issues for developing countries (DCs). Firstly, technology transfers are essential in order that DCs may meet their differentiated responsibilities (not necessarily mandatory) in abating environmental damage. For example, a less greenhouse gases (GHGs) intensive growth path in the case of India and China may involve switches from Conventional Pulverized Coal Thermal Power technologies to more energy efficient or "advanced" Coal Power technologies. Research and Development (R&D) in respect of the latter have, for the most part, been carried out in industrialized countries (ICs), whose firms, accordingly, own the relevant IPRs. Technology transfer from the owners to the relevant agents in DCs will be necessary, and the important questions here relate to the terms, depth of, who pays for and how much, for such transfers. Secondly, most clearly, in the case of biodiversity conservation, environmental protection (and perhaps traditional knowledge) will furnish important positive externalities to the process of technology generation (e.g. pharmaceutical products, agricultural crops) and the question is how to enable the DCs to realize payments for these external benefits to technology producers. This issue is distinct from the question of paying the opportunity costs of biodiversity conservation. Each of these broad issues is spiked at the core with considerations of equity between nations, and across generations. However, this paper is not primarily an exploration of such equity issues.

In the next section we look briefly at the theoretical underpinnings of IPRs, including a brief restatement of DCs perspectives.

2. Theoretical basis of IPRs¹

The standard justification for the granting of property rights over intellectual property is that such rights furnish incentives for creative work. Further, they are sought to be fine-tuned so that the incentives maximize the difference between the value of the resulting intellectual property and the social cost of its creation, including administration and transactions costs. In other words, the specifics of IPRs regimes are designed to realize economic efficiency. Some further questions are involved:

First, IPRs regimes are premised on the belief that prospective financial returns in fact drive private creators of intellectual property. In other words, private creators will have sufficient incentives only if they have the ability to capture at least some of the value that users place on such property. If they are unable to do so, the amount of innovative activity may be inefficient.

Second, there is the issue of whether innovative activity takes place at least social cost. This may depend upon the extent to which creators may borrow ideas or concepts from earlier work. For example, rights to "derivative work" are typically vested in the authors under copyright law, resulting in increased costs to subsequent authors.

Third, somewhat related to the second issue, is whether the IPRs regime maintains a proper balance between the creation and dissemination of intellectual property. A particular incentive structure may result in resources being assigned to the creation of many new works. If however, these innovations are not widely used, the net societal benefits may be less than in the case where fewer resources are employed in creativity, but the intellectual property created is more widely disseminated. This issue focuses attention on two important questions on the appropriate scope of protection. One, what is the optimal duration of IPRs protection, for example, in case of patents. Two, what is the optimal trade-off between the duration and breadth of IPRs protection? Another way of looking at this issue is in terms of trade-offs between static and dynamic efficiency. The former would require that innovations resulting from resources invested by private agents be made widely available to all who are willing to pay the (low) marginal cost of dissemination. Accordingly, public policy should facilitate the widespread use of these assets, implying minimal property rights in them. Dynamic efficiency considerations, on the other hand would suggest that with minimal property rights, the creators may not recover their initial investment, let alone attain sufficient returns to moti-

¹ The following discussion is adopted from Besen and Raskind (1991).

vate them to undertake such chancy activities in the first place. Accordingly, property rights should be stronger ("exclusive") than would be implied under static efficiency.

Formally, IPRs are domestic policy instruments granted by national authorities. However, since innovations embodied in products (or by themselves) cross borders, the question of IPRs protection in international transfer is important. On the other hand, countries have differing perspectives on the socially optimal trade-offs between duration and breadth, and indeed, on what categories of knowledge may be conferred IPRs protection. The questions of harmonization of IPRs legislation across countries and transboundary protection are important current issues of international political economy. A brief account of perspectives of DCs, in this debate, is furnished below:

2.1 Developing country perspectives¹

We take the current Indian IPRs system as a model of an IPRs regime, incorporating the typical concerns of the developing countries. This regime diverges from typical IPR regimes of OECD (Organization for Economic Cooperation and Development) countries, in three major aspects:

First, several categories of products and processes are excluded from IPRs protection. They include horticulture, agriculture, and food processes, and medicinal and drugs products. The rationale is that a majority of the population depends on agriculture and horticulture for its livelihood; that the purchasing power of the poor for food is limited; and because basic health care is scarce.

Second, while the system rewards innovators, it is not intended to confer monopoly rights in manufacture or imports. Accordingly, the regime permits compulsory licensing² for working patents in India.

Third, the regime seeks to promote diffusion of existing technologies and innovation of technologies which create economic opportunities for a late industrializing economy. Accordingly, in several sectors (e.g., pharmaceuticals) processes may be protected while product patents are disallowed, facilitating the wider use of the products as well as local R&D in alternative manufacturing processes.

¹ This subsection relied on Nayyar (1992)

² A compulsory licence is one of the means of limiting the exercise of patent rights in the interest of the public. A compulsory licence is an authorization by an authority designated for this purpose (in India it is granted by the Controller General of Patents) to a person other than the patentee to do, without authorization by the patentee, acts which would otherwise be excluded by the patent. In India, it is granted in the condition of non-working of a patent or if the patent holder does not fulfil the obligations.

These features of the Indian IPRs regime are at bottom, expressions of equity and technological development concerns. Equity within the society is sought to be realized teleologically, focusing on the need to enhance entitlements to basic needs by the poor, particularly in respect of livelihood, food, and medicine. This is attempted to be accomplished through the IPRs regime itself, rather than a separate overall policy framework for social welfare. Accordingly, in pursuit of equity, property rights (in respect of both duration and breadth) for creators are weakened.

The second policy imperative, of facilitating technology development, derives from the fact that comparative advantage across countries based on knowledge requires a policy framework which accelerates knowledge (and skill) acquisition. Accordingly, this policy objective justifies narrower IPRs protection, besides exclusions from patentability.

These considerations are sought by DCs to justify differentiated IPRs regimes in ICs and DCs. The scholars from DCs have argued that the draft agreement on IPRs at GATT (General Agreement on Trade and Tariff) the "Dunkel Draft" neglects these concerns, focusing instead on the interests of ICs. Thus the proposal "seeks to expand the scope of the IPRs system, increase the life of privileges granted or rights conferred, extend the geographical spread where the privileges or rights can be exercised, reduce the restrictions on the use of rights conferred and, above all, create an enforcement mechanism with retaliation across sectors" (Nayyar, 1992). More specifically, exclusions from patentability under the Dunkel draft would be restricted to life-forms, implying that exclusions on product patents would be disallowed. Further, the burden of proof in suits for violation would be reversed with the onus on the alleged infringer. In addition, compulsory licensing would be severely restricted, and imports deemed as working the IPRs. The period of protection would be extended (from 14 years, the current duration in India) to 20 years. These are important deviations from, for example, current Indian patent law. Serious consequences are prognosticated: essential technologies may become unaffordable; the emergence of domestic technological capacity may be stymied; transfers of technology may be retarded; and restrictive business practices by Transnational Corporations (TNCs) may increase. These impacts would accentuate inequalities between ICs and DCs.

Some other scholars (e.g., Sengupta, 1991), on the other hand, have argued that strengthening IPRs protection in DCs (albeit not on the lines of the Dunkel draft) would ensure continued Foreign Direct Investment (FDI). This is because of a perception in the international business community that investing in countries with weak IPRs protection is risky. Empirically, however, it has been noted that the laws governing foreign investment and technology transfer, as well as the general industrial environment, play a greater role in determining investment and technology flows than IPRs protection levels. Accordingly, strengthening IPRs pro-

tection may neither adversely affect developmental concerns, nor necessarily attract foreign investment and technology flows.

In the next two sections, we present descriptive accounts of some key IPRs instruments, as well as modes of technology transfer.

3. Principal Types of IPRs

The two principal types of intellectual property, relevant for technology transfer in the global environmental policy context are "patents" and "trade secrets". A discussion of the types of IPRs is important since a significant proportion of technologies (in both the Conventions) are under such protection and the alleged lack of adequate protection in certain developing countries, could be cited as a deterrent to effective transfer. Also in the Biodiversity Convention, the mention of prior informed consent includes an element of disclosure whose treatment varies while using different IPR instruments. Harmonization of domestic legislation to facilitate trans-boundary technology transfer may have repercussions within the country as well.

3.1 Patents

A patent may be granted by designated public authorities in a country on "any new and useful process, machine, manufacture, composition of matter, improvement and plant as well as to new, original and incremental design for an article of manufacture" (Chisum, 1989). In India, patents are granted under the Indian Patent Act, 1970, which was based on the report of the Tek Chand/Iyengar Commission on the subject. There are important departures in the Indian statute from typical patent laws in OECD countries, relating largely to duration and patentability, i.e., exactly what kinds of innovations may be patented. These differences are discussed above.

What exactly are the terms of the property right conferred on a patent holder? In exchange for disclosure of the subject matter of the innovation to the public (which would include actual and potential rivals), the patent holder (patentee) is enabled to exclude all others from making, selling, or using the subject matter of the patent for a specified period. During this term, any use of the subject matter of the patent requires permission of the patentee, usually by means of a license involving royalty payments. The patentee can even prevent an independent subsequent inventor of the same subject matter from making, using or selling it. At the end of the period of protection, the subject matter enters the public domain, i.e., all property rights cease.

Many questions about patents are still widely debated. There is little agreement among economists on the impact of patent protection on the growth of technology (Kitch, 1986), or on the optimal (dynamically effi-

cient) duration of patents (McFetridge and Ratiquzzaman, 1986). Further, the evidence on whether patents have helped cartelization is inconclusive (Hall, 1986).

Patents are frequently the subject of court proceedings, often by suits by patentees alleging infringement. Courts may interpret the patent claim literally, or infringement may be found if there is a "substantial, functional identity between the patent claims and the contested item" (Besen and Raskind, 1991) i.e., the "doctrine of equivalents". In fact, one important legal issue is whether a patent effectively covers more than the literal disclosure in the patent application or also includes the prospective technology that follows.

Four principal lines of defence are open to alleged infringers. The grant of the patent may itself be challenged: first lacking the requirements of novelty and non-obviousness, second, fraudulence by the patentee may be alleged by misrepresenting the prior state of the art in the patent application, third, a patent is invalid if it was patented elsewhere or described in a printed publication; and finally, the "doctrine of misuse" relates to the use of a patent beyond its statutory scope. For example, if the license involves a tying arrangement, i.e., the licensee must purchase another product from the patentee.

Biotechnological patents are classified by the Indian Patent Office in International Patent Classification (IPC) sub-class C12D (2nd Edition of IPC). This subclass entitles the "production of chemical substances, other than ethanol, by fermentation or biosynthesis," and include the microbiological production of vitamins, toxins, antibiotics and other compounds.

3.2 Trade Secrets

Trade secrets are specific commercial information. One definition is "information including a formula, pattern, compilation, program, device, method, technique, or process, that: (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy" (US Uniform Trade Secrets Act, 1979).

Trade secrets are thus, by definition and unlike patents, not disclosed. Trade secret law only protects such information from "improper" disclosure, but not against independent discovery or by reverse engineering (e.g., determining the chemical formula of a pharmaceutical product through chemical analysis). The incentive to create intellectual property protectible as trade secrets derives from their potential value. Trade secrets also differ from patents in respect of subject matter and duration of protection. While innovation or novelty is required of the subject matter

or patent protection, commercial value is the sole criterion for protection is a trade secret. Moreover, the duration of trade secret protection is indefinite, limited only by the accident of independent discovery (or improper disclosure).

"Improper" disclosure requires either a breach of duty by an employee (with access to the trade secret) to maintain secrecy. Alternatively, the improper act includes theft, bribery, misrepresentation and commercial espionage; in fact anything that would count as wrongful conduct even outside trade secret law. Relief against improper disclosure includes injunctions and damages.

Clearly, many categories of inventions may be eligible for protection under either patents or trade secrets law (but obviously not both)¹. Although trade secrets law offers lesser protection, because filing a patent application involves heavy transactions costs, while the costs of preventing disclosure of a trade secret may be less, a trade secret is often the preferred course. Alternatively, the disclosure required of patent applications may convey sufficient useful information to potential rivals engaged in a race for related or for the next generation of innovations, and this may lead innovators to prefer trade secrets protection.

3.3 Plant Breeders' Rights (PBRs)

The need for plant breeder rights was that earlier classical breeding methods of crossing and selection were used to create new varieties and they did not satisfy the conditions of patentability, in particular reproducibility and non-obviousness. To obtain protection the applicant must show that the submitted plant variety is (i) stable (that it reproduces true to form over repeated propagations), (ii) homogenous (that important characteristics are uniform across a single planting), (iii) distinctive (clearly distinguishable from existing varieties), and (iv) having a variety denomination. Protection is normally granted for a minimum of 15 years. PBRs are subject to a farmer's exemption and a research exemption. The farmer's exemption allows users the right to retain part of the harvest for subsequent planting as seed. The research exemption permits breeders to use a protected variety in subsequent breeding and to apply for protection of the outcome as long as repeated use of the protected variety is not required. The International Convention for the Protection of New Varieties of Plants (UPOV), (administered by the International Union for the Protection of New Varieties of Plants) governs this form of IPRs protection. This Convention also has a clause prohibiting "double protection" i.e. use of both patents and plant variety. The protection offered by Plant Breeders' Rights differs from patent protection in that it only concerns the marketing

¹ Under the UPOV Convention (1983) there is a clause preventing the protection of biotechnological invention by both patents and plant variety rights.

of propagating materials (seeds, etc.) but not the growing and marketing of plants themselves. In the case of asexually reproduced plants, "plant patents" are available.

4. Modes of Technology Transfer

Technology transfer is defined as the process by which technology, knowledge and/or information developed in an organization, in a given area, or for a particular purpose is applied and utilized in a different setting or context.

Bell (1990)¹ distinguishes categories of transferrable technology and has identified them as three flows:

- **Flow A: capital goods, services and design specifications**

Technology here refers to hardware or machinery and equipment, which is acquired and brought into operational use during investment projects. Other technological and managerial services included in investment projects cover execution of planning and feasibility studies, types of design engineering, project management services, etc. The flow of capital goods and services add to the production capacity of the transferee, or in the case of equipment designs, provide domestic capital goods producers with specifications for setting up similar facilities.

- **Flow B: skills and know-how for production**

Included in most technology transfer agreements is the flow of know-how required to operate and maintain new or improved production facilities. There are two main components in this flow:

- a. "Paper embodied technology"- in the form of manuals, schedules, flow charts, including operating procedures, maintenance and repair procedures, routine quality control, and possibly procedures for marketing outputs and purchasing inputs.
- b. "People embodied technology"- refers to knowledge and expertise required to carry out procedures, which in turn includes training of individuals in requisite skills, or in dealing with situations not covered in manuals and routines. This flow (which includes know-how and expertise) also adds to the production capabilities of the transferee.

¹ Bell, M., Continuing Industrialization, Climate Change and International Technology Transfer. A report prepared in collaboration with the Resource Policy Group, Oslo, Norway. Science Policy Research Unit. University of Sussex (1990).

Although Flow A and B add to the production capacity of the transferee, they do not contribute substantially to the his "technological capacity" of the transferee. Neither does the transfer of capital goods or of know-how (which aid in production of a product) add to the expertise and experience required to change, adapt, and develop the product or process in the future. The prospects of subsequent improvements are neglected in Flows A and B.

• **Flow C: knowledge and expertise for generating and managing technical change ("know-why")**

Like Flow B, it also consists mainly of information and people embodied knowledge and expertise. It differs from Flow B, in that it is concerned with changing technical systems. There is obviously some overlap between Flow B and Flow C.

The depth of knowledge and information about the technology in Flow C would be greater than that required for routine operation and maintenance. The other (and crucial) component is the expertise required to undertake various engineering design studies, or the evaluation of alternative plans and designs, or the incorporation of technology in improved production systems. Through this flow, continuous technical change could be realized in existing production facilities.

The transfer of technology can occur from a supplier to a recipient by various mechanisms. The modes of technology transfer may be classified as commercial or non-commercial. Commercial transfers are contracted primarily through markets, and non-commercial transfers occur primarily through non-market institutions.

The principal commercial methods of transfer are:

- (1) Direct foreign investment in a host country subsidiary or a joint venture.
- (2) Licensing of intellectual property rights, usually on royalty payments.
- (3) Technical assistance.
- (4) Sale, importation, installation, and servicing of machinery and other capital goods; and
- (5) Franchising of consumer goods and services.

Some of the non-commercial methods of technology transfer are:

- (1) Advisory groups.
- (2) Personnel exchanges.
- (3) Information dissemination.
- (4) Education.

Though it must be noted that successful transfers are usually a combination of several (all) of these mechanisms. The effectiveness of transfer is a function of the stage of technological development, characteristics of end users, its potential for absorption within the recipient country, besides other factors. Two principal commercial modes of technology transfer are discussed below in more detail:

4.1 Foreign Direct Investment (FDI)

Technology transfer is often a component of foreign direct investment, although each may also stand alone. The flow of technology to developing countries has frequently constituted a part of foreign direct investment, typically by large transnational corporations (TNCs).

Technology transfers between affiliates constitute a significant share of such transactions. Transfers involving the parent firm and their branches, or wholly (or majority) owned subsidiaries are usually done informally, and do not include formal agreement(s). In contrast, when the foreign investment is a joint venture, where the local partner is a majority owner, a formal agreement/license is typically negotiated between the technology supplier and the recipient.

The mechanism of transfer through direct foreign investment may appeal to the supplier because control is retained apart from the earning of dividends rather than royalties. Control of the local enterprise is often comprehensive: management, operation and marketing, quality control of products. This facilitates control of the technology itself as a trade secret rather than submitting to the disclosure required by patents.

From the viewpoint of the recipient, foreign investment brings in capital in the form of foreign exchange, and the security of the foreign partner's long-term commitment. However, local innovative improvement of the imported technology may be thwarted by the supplier quite deliberately.

4.2 Licensing of Intellectual Property Rights (IPRs)

Technology transfer can occur independently of direct foreign investment by means such as intellectual property licenses.

A patent licence transfers to the licensee several of the exclusive rights of the patent. The licence is usually obtained by the payment of lump-sum fees or royalty, although other commercial arrangements are also possible.

Such an agreement enables a foreign licensor, unwilling to risk his capital in a developing country, or uncertain of a project's profitability, or unable to invest in unfamiliar conditions, to benefit from his intellectual property holding. In countries where foreign investment is regulated and local entrepreneurship is strong, technology licensing is increasingly used.

Similarly where host country foreign investment laws are restrictive, either in the form of prohibition of foreign equity participation in certain sectors of the economy, or legislation requiring a phased 'fade-out' of foreign ownership in local subsidiaries/joint ventures, it encourages TNCs interested in penetrating these markets to opt for licensing agreements in place of foreign investment. This has been the typical experience in India till recently.

Licensing is also convenient in that it is for a finite duration. From the recipient's point of view, licensing leaves the recipient free of control and interference. The recipient may also benefit from interaction with his own government in ensuring that the agreement is equitable. However, government interference may also result in restrictive licensing arrangements, which may not be perceived by the licensee as in his interest.

This mode of transfer appears more likely in the case of the Biodiversity Convention (BDC). At the time of negotiating such a licensing agreement, some of the aspects which could find inclusion are a) obligations of licensor (person granting license to licensee) in terms of technology transfer particularly when a genetic resource is supplied b) Applicable law¹ as the BDC refers to the "adequate and effective protection of technologies under IPR protection"; and also because technologies are protected by domestic legislation and transboundary transfers are envisaged and c) Allowance of cross licensing so that further innovations could follow.

5. Role of Government in Technology Transfer

The role of the government in facilitating transfers of technology should not be underestimated. It is responsible for the economic framework of the recipient country, a factor which would influence investment decisions of TNCs. The signals government gives to industry may discourage or encourage R&D as well as influence modes and depth of technology transfer. Governments are also heavily involved in funding or organizing R&D. In India 80% of scientific R&D is in the public sector, a situation similar to that in France. In the US, government funding accounts for 50 per cent of the total R&D investments. Further, governments are heavily involved in setting up the IPRs framework, as well as in negotiating the international IPRs regimes as in GATT.

India had earlier followed a development path of import substitution, and in an effort to substitute imported technologies, indigenous technological capacity was encouraged by a restrictive regime of technology imports. No significant relationship between protection and degree of innovation

¹ A clause of applicable law indicates which country's law is to be used for interpretation of the agreement. This could be the laws of either negotiating party or could be the laws of a third country.

has however been observed (Sengupta 1991). Recent policy changes have significantly liberalized technology imports.

IPRs regimes may impact the Balance of Payment (BOP) situations of countries in several ways. First, a strengthening of IPRs may mean that transferees would have to pay increased royalties in foreign exchange. On the other hand a loss of IPRs earnings due to weak IPRs protection in transferee countries could worsen a trade deficit. For example, it is claimed that the US loses \$60 billion a year owing to IPRs "violations" in other countries.

Government policy also affects technology transfer through regulation of foreign direct investment, in terms of restriction on import of capital goods, and control of technology licensing. For example, India had earlier insisted on a majority domestic equity share of at least 51%.

6. Appropriate Technology

The technologies under consideration for transfer should be "appropriate" from the standpoint of the recipient country. Some of the considerations determining whether the appropriateness of a technology are (i) that it is environmentally friendly, (ii) that it conforms to the development goals of the recipient country, (iii) it harmonizes with its resource endowments, and (iv) that the conditions under which the transfer occurs relate to its circumstances.

Appropriateness, in the case of biotechnology must also take into particular consideration the safety aspect (design defect and failure to warn) of some of the products of these technologies. The resulting implications may require a re-examination of domestic environmental legislation, particularly those relating to legal liability for damages.

Developmental goals may relate to promotion of self reliance, removal of inequalities in income, increasing employment opportunities, etc. Resource endowments relate to availability of natural resources, manpower, managerial skills, etc. The prevailing conditions include the existing infrastructure, markets, and other institutional structures. Appropriate technologies in this context may include those that are labour intensive, use local materials, are not capital intensive, and may be operated on small scales.

7. Relevance to Global Environmental Agreements

In this section, we discuss technology transfer issues with particular reference to the Conventions on Climate Change and Biodiversity Conservation. Its relevance within the Biodiversity Convention has been dealt with in greater detail.

The Climate Change Convention commits DCs to three specific actions:

- (a) To formulate and implement publicly notified plans for abatement and adaptation.
- (b) Take action to minimize any adverse effects of abatement or adaptation measures on the economy, public health and the environment.
- (c) Additionally, DCs may submit specific abatement (reduction of GHGs), projects for funding.

In these, the DCs are entitled to financial resources, outside of normal developmental assistance, including the transfer of technology. The quantum of assistance is described as the "agreed full incremental costs". If such assistance is not forthcoming, DCs have no commitments.

Technology transfer is thus visualized in respect of both abatement and adaptation measures (context of climate change), and to ensure that any harmful impacts of the measures themselves are minimized. No concessional or non-commercial terms of technology transfer are envisaged; only that the financial component (in the terminology employed) shall qualify as grant. Further, no attenuation of IPRs protection of the technologies are contemplated.

Similarly, the Biodiversity Convention requires all countries, including developing countries, to formulate national strategies for conservation and sustainable use of genetic resources, integration of conservation concerns in policy making, establishment of protected areas etc., to conserve biodiversity; domestic legislation for conservation and promotion of public awareness for biodiversity conservation. The implementation of these commitments by developing countries is, again, contingent on the developed countries meeting their own (further) commitments relating to transfer of technology and "new and additional" financial resources for meeting the "agreed full incremental costs" of such measures. The question of what exactly would count as full incremental costs in the context of technology transfer is obviously important and this is considered in the next section.

7.1 Specifics within the Biodiversity Convention (BDC)

The Convention while recognizing that technology (inclusive of biotechnology ¹) and its access and transfer are a means for attaining the Convention objectives; has categorised them as: (i) those technologies rele-

¹ The Office of Technology Assessment of the US Congress (1984, 1988b) has defined biotechnology as any technique that uses living organisms (or parts of organisms) to make or modify products, to improve plants or animals, or to develop micro-organisms for specific use. The UNIDO/WHO/UNEP Working Group on Biotechnology Safety defined it as the application of biological systems and organisms to scientific, industrial, agricultural and environmental processes and uses. The Convention defines it as any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.

vant to conservation and the sustainable use of biodiversity (ii) biotechnologies based on the genetic resources themselves.

Technology transfer is constituted by a knowledge component and a payment component. The former includes elements such as extent of knowledge transferred, and conditions limiting the use of such knowledge such as spatial (territorial aspects), and temporal (time period) restrictions, obligations of both licensor and licensee, retransfer of rights and obligations to third parties, R&D involving transferred knowledge, allowance of cross licensing, length of agreement, depth of transfer, applicable law (clause relating to law to be followed in the event of a dispute), etc. The latter includes terms of compensation for the transferred knowledge, which may include both direct and indirect modes of payment. This component may also encompass incentives for innovation and conservation, to parties supplying the genetic material either in a national or an individual (agent) capacity. Payment related concerns also arise in the event that the contracting parties provide financial and other support for ex-situ conservation facilities in developing countries; particularly with respect to access of the donor country to the genetic material.

The major movement of technology is anticipated to be from the ICs (which are technologically rich and gene poor) to the DCs (gene rich and technologically poor) and traditional knowledge and practices from the DCs to the ICs. Table 1 gives an idea of the major donors and beneficiaries of germplasm (Mooney, P.R. 1985) which demonstrates the reverse in the case of germplasm.

Table 1: Major Donors and Beneficiaries of Germplasm		
Region	Donors (Per cent)	Beneficiaries (Per cent)
Asia	34.2	4.2
Africa	34.0	4.6
Latin America	22.9	6.3
West Europe	8.6	15.9
East Europe	--	1.9
North America	--	23.8
IARCs	--	41.3
Others	0.3	1.9
Source: Mooney, Law of the seed Revisited. Development Dialogue, 1985 (1), pp. 139-152.		

Transfer of conservation technologies

The BDC recognizes the need for transfer of technologies relevant for conservation and sustainable use of biodiversity, on "fair and most

favourable terms" to developing countries. It is stated that the contracting parties are aware that conservation¹ and sustainable use of biodiversity are of critical importance for meeting the food, health and other needs of the growing world population, for which purpose access to and sharing of both genetic resources and technologies are essential. Legislative, administrative and policy measures would be undertaken to ensure that the private sector facilitates access to, transfer and joint development of the appropriate technologies.

To fulfil this need the Convention mentions the establishment and maintenance of facilities for ex-situ conservation of and research on plants, animals and microorganisms, preferably in the country of origin of genetic resources². This facility of conservation will be encouraged by the provision of finance to developing countries.

Transfer of biotechnologies utilizing genetic resources and implications for existing IPR regimes

A primary requisite for the development of technologies based on the genetic resource is access to such material, either under in-situ or ex-situ conditions. The sovereign rights of states over their natural resources are recognized in the BDC, and the authority to determine access to their country's genetic resources rests with the concerned national governments although it is stated that environmentally sound uses of these genetic resources should be facilitated and no restrictions imposed which run counter to the objectives of the Convention. How this would be enforced is clearly a problem given that it is difficult to restrict physical access to this resource. Another diluting factor is that most germplasm is exchanged informally and occasionally even through third parties. On the other hand it is important to clarify that developing countries would like access to genetic resources of economic interest (including newly developed varieties

¹ Definition of in-situ conservation

It has been defined as "the continuing maintenance of a population within the community of which it forms a part, in the environment to which it is adapted". (Commission on Plant Gen. Res., Item 5, 11-15 March 1985). It is most often used for wild species and wild relatives of crops and animals, but "can include artificial regeneration whenever planting or sowing of seed is carried out, without conscious selection, on the same area where the seed was collected" (Commission on Plant Gen. Res., Item 5, 11-15 March 1985).

Ex-situ conservation is the conservation of organism outside their natural habitat. Although in-situ conservation is to be encouraged, the species to be conserved (other than those having potential for sustainable use) have not been identified.

² Country of origin of genetic resources means the country which possesses those genetic resources under in-situ conditions.

and special genetic stocks, inclusive of current breeder's lines and mutants).

Depth and nature of technology

The absence of detailed treatment of the depth of transfer within the BDC should lead to its inclusion, as a subject of a future protocol. Secondly, the convention addresses the identification of innovative, efficient and SOA technologies and know-how relating to the conservation and sustainable use of biodiversity {Art. 25(c)} by the subsidiary body on scientific, technical and technological advice. Those relating to the development of genetic resources have not been addressed. An inventory of such SOA technologies appropriate for conditions in developing countries could be established and maintained.

Specifically, technology transferred may include both exchange of results of technical, scientific and socio-economic research {Art.17 (2)}, and promotion of cooperation in the training of personnel and exchange of experts {Article 18(4)}. It would also involve the promotion of establishment of joint research programmes and joint ventures for the development of technologies {Article 18(5)}.

Technical cooperation

Regarding the potential for joint R&D, particularly in the area of biotechnology involving developing country participation, some of the issues of concern are:

- i. What would be the implications for IPR regimes and ownership of rights ?
- ii. What are the incentives offered to developed country contracting parties (private sector) for participation? Potential reasons could be the high expenditure involved, spread of risk through the sharing of capital and access to genetic material held in the developing country.

One model of patent ownership in joint ventures, has been developed by the US Agency for International Development which has developed a project whereby scientists of developing countries participate in joint research with private companies, for the development of products for use in overcoming certain agricultural constraints in the developing world. Patents on resulting products (e.g. pest/drought resistant sorghum) would be held jointly by the private company and the scientist's home institution.

Contractive framework of the BDC

Another set of technology transfer issues are also at the heart of the Biodiversity Convention (BDC). At its core, this Convention attempts to

set up a framework by which access to genetic resources are granted (typically by DCs to ICs) in exchange for transfer of the technology embodying the genetic resource. Because it is physically impossible to deny access to the genetic pool conserved, the framework stipulates (in the official Indian interpretation) that disclosure of the fact of use of particular genetic resources shall be made. The parties shall conduct the exchange on "mutually agreed terms", meaning commercial contractual agreements involving royalty payments.

In this case, since what exactly comprises "technology transfer" remains undefined, ICs may endeavour to place the least restrictive interpretation on the term. Apart from depth of transfer, since sharing of IPRs rents are envisaged, questions about duration of transfer and geographical limits over which the licensed (transferred) rights may be exercised are important.

Serious legal issues are raised by the apparent requirement of compulsory disclosure of the source of genetic resources employed, and transferring the "make or license" discretion from the IPR holder to the gene supplier. For one, trade secrets protection may no longer be available. For another, patent protection may significantly lose its exclusionary power. It seems that the stipulation of mandatory technology transfer in the framework for contracts confers little negotiating advantage to DCs. Further, the effectiveness of the new regime hinges critically on exactly what penalties follow in the event of non-disclosure¹. If the penalties are non-existent or not severe, the regime would be ineffective. The reasons for this are briefly discussed below:

There will be a clear asymmetry of information between the gene supplier and the agent developing the biotechnology, notwithstanding the fact that supply of genetic resources is to be with the "prior informed consent" of the supplier. The latter would, at the time of negotiations, have already completed a significant amount of research, know fairly well what it was looking for, and benefitting from the provisions of the BDC facilitating mapping and organization of genetic information, a reasonably good idea of the chances of finding it. The developing country negotiators in such contracts would have relatively lesser information (unless the country attempts to screen its national genetic wealth to channelize such access to resources), since much of it would be proprietary to the potential user, and would therefore have little idea of the true value of the resource. As of the present there are no clearly defined penalties for failure to disclose.

Second, is the question whether the requirement of (compulsory) transfer of technologies enhances the bargaining strength of developing coun-

¹ It is critical that it is understood that it would not usually be feasible to detect non-disclosure of origin of the genetic resource.

tries. As noted above technology transfer may occur in several varying depths. The Convention is silent on this aspect.

Suppose that disclosure of use of genetic resource is, in fact, effectively mandated. In that case, biotechnology innovators must negotiate with the gene supplier regarding sidepayments and depth of technology transfer, in return for access to the gene pool. The gene supplier may be prepared to trade-off reduced depth for increased sidepayments, but would start with the disadvantage of not knowing the gene pool's true worth. It would therefore, very likely make trade-offs along an indifference contour which at every point is below that which would be the case if it had full information. The latter, on the other hand, having revealed less than the gene pool's perceived true worth, would also prefer to trade-off reduced depth for increased sidepayments, within the disclosed valuation of the resource, since at least part of the negotiated sidepayments may be paid by the multi-lateral fund. If the administrators of the fund do not intervene, the likely result is only nominal technology transfer and low level of sidepayments.

However, the administrators of the fund may seek to eliminate such free rides on its finances by the gene users. Accordingly, they may attempt to negotiate norms both for sidepayments, as well as depth of transfer (which, as pointed out above, may also be an issue in defining incremental costs). In this, developed countries would collectively reveal less than their true valuations for access to genetic resources, and may also attempt to protect gene users' rights by proposing restrictive norms for depth of technology transfer. Since DCs would not know the true valuation of the resource, and collectively have little taste for increasing depth at the expense of sidepayments on offer, the process of evolving norms may only tend to freeze the earlier outcomes.

Further, even if such norms do not emerge and all sidepayments are directly paid by gene users, rents from IPRs can be captured equally by sale of goods involving the technology, or by licensing agreements.

What kinds of policy responses are possible and appropriate for DCs? A minimal step is that in negotiating protocols under the Convention, they should insist upon restricting the availability of IPRs protection to biotechnology to categories in which full disclosure of the use of genetic resources is required, i.e. trade secrets type IPRs must not be available for technologies employing genetic resources. Additionally, that contracts for access must be filed along with the application for IPRs protection for the innovation (biotechnology). This may be pursued in the GATT forums as well. Additionally, they should unilaterally incorporate this restriction on IPRs protection for biotechnology in their domestic legislation. It is only the unambiguous requirement of disclosure that will compel gene users to enter into contracts for access.

7.2 *Technology transfer and full incremental costs*

We have noted above that commercial technology transfers may occur in a dense set of modes and their combinations, from direct foreign investment protected by trade secrets, to transfer of in-depth R&D capability ("Flow C") under patent licenses on the other. One issue in defining "full incremental costs" is what is the "depth" (in multiple attributes) whose licensee fees would be covered by multilateral transfers to DCs through the concerned financial mechanisms (FMs). ICs may be expected to support transfers through "Flow A" regimes and/or by FDI, while simultaneously pressing for liberalized FDI regimes in GATT, as well as bilaterally. DCs views may be more varied, with countries like China and India perhaps perceiving the advantage in "Flow C" types of transfers, and the use of FDI being a choice variable for national authorities, rather than the IPRs holders. Rents for IPRs licences will depend on the precise attributes of the licence, i.e., the depth of technology transfer; and spatial and temporal extent of jurisdiction of the licence.

Clearly, what types of technologies and what depths of technology transfer would qualify for concessional funding, are important areas of future negotiations. Some of the strategic bargaining aspects of these negotiations are as follows:

In negotiating technology transfer norms, ICs may argue (and calculate) that since "no regret" measures are in themselves of net advantage to DCs, they should (may) adopt them anyway, without any external concessional funding for in-depth transfer of such technologies under the provisions of the Conventions.

One argument that DCs may advance involves the concept of an "investment hurdle" or "capital-gap". Several no-regrets strategies are typically not adopted on a wider scale because their up-front capital costs are higher than competing technologies, even though the no-regrets strategies are more (economically) efficient. The classic example in this respect is hydro versus thermal power; capital shortage typically leads to relative under-investment by DCs in the former, even though it is more economically efficient. DCs may urge that the "capital gap" involved in such no-regret strategies be met by grant funding, because the major decision criterion for investments in their case is initial capital costs rather than (relative) economic efficiencies of alternatives.

Where technology transfer is involved, funding this capital gap may involve royalty payments for in-depth technology transfer, instead of, or in addition to, purchase of capital equipment. This would, however, require the adoption of non-restrictive norms for technology transfers.

Accordingly, another possible stratagem for DCs is to delink questions of depth of technology transfer from whether the options are "no-regret", or involve positive (economic) costs, i.e., the norms should apply to both categories identically. What would be the advantage to DCs? Many of the

important abatement measures (i.e., in terms of scope for GHGs reductions or conservation measures for biodiversity) may, in fact, be in the latter category (e.g., switch to natural gas based power generation from coal based power generation). If ICs perceive that it is in their interest to persuade DCs to adopt these, they would need to concede grant funding at sufficient levels that the DCs are at least indifferent between these and the conventional options. If DCs further insist that norms for depth of technology transfer are not restrictive (including restricted to positive cost options), enabling them to utilize such funding for technology transfer in depth, they may still be on strong negotiating ground in respect, in particular for conservation of genetic resources which are unique and whose loss is irreversible. The application of such non-restrictive norms to no-regrets strategies may enable DCs to employ capital gap funding for in-depth technology transfers in such cases also.

The problem of strategic bargaining to realize these and other advantages is complex. DCs are as a group, more heterogeneous, including in their economic interests, than ICs. Further, they are susceptible in different degrees to bilateral inducements and pressures from powerful ICs. This is evident from the negotiating processes leading to the Rio Summit. On the other hand, a few key DCs have the potential to collectively alter use of global environmental resources significantly in a few decades, giving their possible coalition considerable synergy. Strategic bargaining aspects of these questions, thus need to be addressed carefully.

One possible response to the question of norms for technology transfer is for the financial mechanism to purchase the IPRs for a set of abatement (conservation) technologies outright, and place these in the public domain. In that case, any country wishing to employ these technologies may do so at any depth; without it (or the FM) paying any further licensee fees.

Would such alternative arrangements be preferable for DCs? To answer this point, one may note that the universe of possible benign technologies is extremely large. Any selection must be of a far smaller set, because of limited financial resources with the FM. Since the technologies must be voluntarily placed on offer, and the potential recipients also involved in making the choice, the question arises as to whether or not one may expect outcomes in which the most efficient (or "state of the art") technologies would enter the public domain. The vendors would have complete information about their own technologies, while the recipients would be unable to acquire such information, till the technologies are actually disseminated. A variant of the "market for lemons" phenomenon, well known in the economics literature, may therefore emerge. That is, because of information asymmetry, only the worst of the benign technologies (which are still improvements over current practice) would be actually transferred. By this means, DCs would be able to choose only from a small set, or be saddled with existing inferior technologies. Further, since the performance of any

given technology is highly context specific, and the situations of DCs are extremely varied, there would be little assurance that a particular technology would perform as advertised in a given DC situation.

The "market for lemons" may, of course, also arise in the alternative case of individual DCs identifying benign technologies and the associated depth of transfers. In this case, however, the choice would be from a larger set, and DCs may be better able to relate technologies to their own circumstances. The greater freedom of choice may be of advantage to DCs.

8. Conclusion

It is extremely difficult to successfully conclude a paper such as this given the present status of protection of biodiversity. The authors have drawn attention to the concerns of the developing world as expressed in their intellectual property right regimes. Technology transfer across nations, would necessarily require an critical examination of existing IPRs regimes. The requirement in the Biodiversity Convention that for those biotechnologies utilizing genetic resources measures to ensure adequate and effective protection of IPRs will be taken, may imply that domestic legislation of developing countries would require alteration. This is significant in that there are widely differing goals of the developed and the developing world and the alleged lack of adequate protection has been a deterrent to successful transfers. The role of the government in maintaining a balance between public and private interests and as a facilitator of successful transfers has been briefly discussed.

The various instruments of Intellectual Property Protection have been examined although it is not simple to choose a single, preferred mode of protection for biotechnological inventions. It is to be seen which instrument would be best able to incorporate elements of 'compulsory disclosure' of source of genetic material without compromising commercial interests.

The discussion on the nature of flows of technology transfer serve to highlight the fact that the Biodiversity Convention has not given adequate treatment to the subject of 'depth' of transfer. This is of consequence while attempting to define and estimate 'full agreed incremental costs' due to the element of depth which must be taken into account. Since developing countries are not in a position to correctly assess the potential value of a genetic resource in the initial stages of exploitation (particularly due to a lack of information), it would be important to devise contracts for access to genetic resources carefully, negotiating the terms for actual commercial exploitation when greater information about the potential value of the resource is available.

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International Conference on the
**CONVENTION ON
BIOLOGICAL DIVERSITY**

National Interests and
Global Imperatives

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United Nations Environment Programme (UNEP)
WRI/IUCN/UNEP Biodiversity Programme

CONVENTION ON BIOLOGICAL DIVERSITY

5 JUNE 1992

CONVENTION ON BIOLOGICAL DIVERSITY

Preamble

The Contracting Parties,

Conscious of the intrinsic value of biological diversity and of the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components,

Conscious also of the importance of biological diversity for evolution and for maintaining life sustaining systems of the biosphere,

Affirming that the conservation of biological diversity is a common concern of humankind,

Reaffirming that States have sovereign rights over their own biological resources,

Reaffirming also that States are responsible for conserving their biological diversity and for using their biological resources in a sustainable manner,

Concerned that biological diversity is being significantly reduced by certain human activities,

Aware of the general lack of information and knowledge regarding biological diversity and of the urgent need to develop scientific, technical and institutional capacities to provide the basic understanding upon which to plan and implement appropriate measures,

Noting that it is vital to anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source,

Noting also that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat,

Noting further that the fundamental requirement for the conservation of biological diversity is the in-situ conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings,

Noting further that ex-situ measures, preferably in the country of origin, also have an important role to play,

Recognizing the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components,

Recognizing also the vital role that women play in the conservation and sustainable use of biological diversity and affirming the need for the full participation of women at all levels of policy-making and implementation for biological diversity conservation,

Stressing the importance of, and the need to promote, international, regional and global cooperation among States and intergovernmental organizations and the non-governmental sector for the conservation of biological diversity and the sustainable use of its components,

/...

Acknowledging that the provision of new and additional financial resources and appropriate access to relevant technologies can be expected to make a substantial difference in the world's ability to address the loss of biological diversity,

Acknowledging further that special provision is required to meet the needs of developing countries, including the provision of new and additional financial resources and appropriate access to relevant technologies,

Noting in this regard the special conditions of the least developed countries and small island States,

Acknowledging that substantial investments are required to conserve biological diversity and that there is the expectation of a broad range of environmental, economic and social benefits from those investments,

Recognizing that economic and social development and poverty eradication are the first and overriding priorities of developing countries,

Aware that conservation and sustainable use of biological diversity is of critical importance for meeting the food, health and other needs of the growing world population, for which purpose access to and sharing of both genetic resources and technologies are essential,

Noting that, ultimately, the conservation and sustainable use of biological diversity will strengthen friendly relations among States and contribute to peace for humankind,

Desiring to enhance and complement existing international arrangements for the conservation of biological diversity and sustainable use of its components, and

Determined to conserve and sustainably use biological diversity for the benefit of present and future generations,

Have agreed as follows:

Article 1. Objectives

The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

Article 2. Use of Terms

For the purposes of this Convention:

"Biological diversity" means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

"Biological resources" includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.

Each country
protects
its own
resources - maybe
the perfect in a
country
the open

"*Biotechnology*" means any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.

"*Country of origin of genetic resources*" means the country which possesses those genetic resources in *in-situ* conditions.

"*Country providing genetic resources*" means the country supplying genetic resources collected from *in-situ* sources, including populations of both wild and domesticated species, or taken from *ex-situ* sources, which may or may not have originated in that country.

"*Domesticated or cultivated species*" means species in which the evolutionary process has been influenced by humans to meet their needs.

"*Ecosystem*" means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

"*Ex-situ conservation*" means the conservation of components of biological diversity outside their natural habitats.

"*Genetic material*" means any material of plant, animal, microbial or other origin containing functional units of heredity.

"*Genetic resources*" means genetic material of actual or potential value.

"*Habitat*" means the place or type of site where an organism or population naturally occurs.

"*In-situ conditions*" means conditions where genetic resources exist within ecosystems and natural habitats, and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

"*In-situ conservation*" means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

"*Protected area*" means a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives.

"*Regional economic integration organization*" means an organization constituted by sovereign States of a given region, to which its member States have transferred competence in respect of matters governed by this Convention and which has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to it.

"*Sustainable use*" means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

"*Technology*" includes biotechnology.

Article 3. Principle

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the

responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Article 4. Jurisdictional Scope

Subject to the rights of other States, and except as otherwise expressly provided in this Convention, the provisions of this Convention apply, in relation to each Contracting Party:

(a) In the case of components of biological diversity, in areas within the limits of its national jurisdiction; and

(b) In the case of processes and activities, regardless of where their effects occur, carried out under its jurisdiction or control, within the area of its national jurisdiction or beyond the limits of national jurisdiction.

Article 5. Cooperation

Each Contracting Party shall, as far as possible and as appropriate, cooperate with other Contracting Parties, directly or, where appropriate, through competent international organizations, in respect of areas beyond national jurisdiction and on other matters of mutual interest, for the conservation and sustainable use of biological diversity.

Article 6. General Measures for Conservation and Sustainable Use

Each Contracting Party shall, in accordance with its particular conditions and capabilities:

(a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, *inter alia*, the measures set out in this Convention relevant to the Contracting Party concerned; and

(b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

Article 7. Identification and Monitoring

Each Contracting Party shall, as far as possible and as appropriate, in particular for the purposes of Articles 8 to 10:

(a) Identify components of biological diversity important for its conservation and sustainable use having regard to the indicative list of categories set down in Annex I;

(b) Monitor, through sampling and other techniques, the components of biological diversity identified pursuant to subparagraph (a) above, paying particular attention to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use;

(c) Identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity, and monitor their effects through sampling and other techniques; and

(d) Maintain and organize, by any mechanism data, derived from identification and monitoring activities pursuant to subparagraphs (a), (b) and (c) above.

Article 8. *In-situ Conservation*

Each Contracting Party shall, as far as possible and as appropriate:

- (a) Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;
- (b) Develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity;
- (c) Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;
- (d) Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;
- (e) Promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas;
- (f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, *inter alia*, through the development and implementation of plans or other management strategies;
- (g) Establish or maintain means to regulate, manage or control the risks associated with the use and release of living modified organisms resulting from biotechnology which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health;
- (h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species;
- (i) Endeavour to provide the conditions needed for compatibility between present uses and the conservation of biological diversity and the sustainable use of its components;
- (j) Subject to its national legislation, 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 and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices;
- (k) Develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations;
- (l) Where a significant adverse effect on biological diversity has been determined pursuant to Article 7, regulate or manage the relevant processes and categories of activities; and
- (m) Cooperate in providing financial and other support for *in-situ* conservation outlined in subparagraphs (a) to (l) above, particularly to developing countries.

Article 9. *Ex-situ Conservation*

Each Contracting Party shall, as far as possible and as appropriate, and predominantly for the purpose of complementing *in-situ* measures:

- (a) Adopt measures for the *ex-situ* conservation of components of biological diversity, preferably in the country of origin of such components;
- (b) Establish and maintain facilities for *ex-situ* conservation of and research on plants, animals and micro-organisms, preferably in the country of origin of genetic resources;
- (c) Adopt measures for the recovery and rehabilitation of threatened species and for their reintroduction into their natural habitats under appropriate conditions;
- (d) Regulate and manage collection of biological resources from natural habitats for *ex-situ* conservation purposes so as not to threaten ecosystems and *in-situ* populations of species, except where special temporary *ex-situ* measures are required under subparagraph (c) above; and
- (e) Cooperate in providing financial and other support for *ex-situ* conservation outlined in subparagraphs (a) to (d) above and in the establishment and maintenance of *ex-situ* conservation facilities in developing countries.

Article 10. *Sustainable Use of Components of Biological Diversity*

Each Contracting Party shall, as far as possible and as appropriate:

- (a) Integrate consideration of the conservation and sustainable use of biological resources into national decision-making;
- (b) Adopt measures relating to the use of biological resources to avoid or minimize adverse impacts on biological diversity;
- (c) Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements;
- (d) Support local populations to develop and implement remedial action in degraded areas where biological diversity has been reduced; and
- (e) Encourage cooperation between its governmental authorities and its private sector in developing methods for sustainable use of biological resources.

Article 11. *Incentive Measures*

Each Contracting Party shall, as far as possible and as appropriate, adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity.

Article 12. *Research and Training*

The Contracting Parties, taking into account the special needs of developing countries, shall:

- (a) Establish and maintain programmes for scientific and technical education and training in measures for the identification, conservation and sustainable use of biological diversity and its components and provide

support for such education and training for the specific needs of developing countries;

(b) Promote and encourage research which contributes to the conservation and sustainable use of biological diversity, particularly in developing countries, *inter alia*, in accordance with decisions of the Conference of the Parties taken in consequence of recommendations of the Subsidiary Body on Scientific, Technical and Technological Advice; and

(c) In keeping with the provisions of Articles 16, 18 and 20, promote and cooperate in the use of scientific advances in biological diversity research in developing methods for conservation and sustainable use of biological resources.

Article 13. Public Education and Awareness

The Contracting Parties shall:

(a) Promote and encourage understanding of the importance of, and the measures required for, the conservation of biological diversity, as well as its propagation through media, and the inclusion of these topics in educational programmes; and

(b) Cooperate, as appropriate, with other States and international organizations in developing educational and public awareness programmes, with respect to conservation and sustainable use of biological diversity.

Article 14. Impact Assessment and Minimizing Adverse Impacts

1. Each Contracting Party, as far as possible and as appropriate, shall:

(a) Introduce appropriate procedures requiring environmental impact assessment of its proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects and, where appropriate, allow for public participation in such procedures;

(b) Introduce appropriate arrangements to ensure that the environmental consequences of its programmes and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account;

(c) Promote, on the basis of reciprocity, notification, exchange of information and consultation on activities under their jurisdiction or control which are likely to significantly affect adversely the biological diversity of other States or areas beyond the limits of national jurisdiction, by encouraging the conclusion of bilateral, regional or multilateral arrangements, as appropriate;

(d) In the case of imminent or grave danger or damage, originating under its jurisdiction or control, to biological diversity within the area under jurisdiction of other States or in areas beyond the limits of national jurisdiction, notify immediately the potentially affected States of such danger or damage, as well as initiate action to prevent or minimize such danger or damage; and

(e) Promote national arrangements for emergency responses to activities or events, whether caused naturally or otherwise, which present a grave and imminent danger to biological diversity and encourage international cooperation to supplement such national efforts and, where appropriate and agreed by the States or regional economic integration organizations concerned, to establish joint contingency plans.

2. The Conference of the Parties shall examine, on the basis of studies to be carried out, the issue of liability and redress, including restoration and compensation, for damage to biological diversity, except where such liability is a purely internal matter.

Article 15. Access to Genetic Resources

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

2. Each Contracting Party shall endeavour to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and not to impose restrictions that run counter to the objectives of this Convention.

3. For the purpose of this Convention, the genetic resources being provided by a Contracting Party, as referred to in this Article and Articles 16 and 19, 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.

4. Access, where granted, shall be on mutually agreed terms and subject to the provisions of this Article.

5. Access to genetic resources shall be subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party.

6. Each Contracting Party shall endeavour to develop and carry out scientific research based on genetic resources provided by other Contracting Parties with the full participation of, and where possible in, such Contracting Parties.

7. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, and in accordance with Articles 16 and 19 and, where necessary, through the financial mechanism established by Articles 20 and 21 with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources. Such sharing shall be upon mutually agreed terms.

Article 16. Access to and Transfer of Technology

1. Each Contracting Party, recognizing that technology includes biotechnology, and that both access to and transfer of technology among Contracting Parties are essential elements for the attainment of the objectives of this Convention, undertakes subject to the provisions of this Article to provide and/or facilitate access for and transfer to other Contracting Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment.

2. Access to and transfer of technology referred to in paragraph 1 above to developing countries shall be provided and/or facilitated under fair and most favourable terms, including on concessional and preferential terms where mutually agreed, and, where necessary, in accordance with the financial mechanism established by Articles 20 and 21. In the case of technology subject to patents and other intellectual property rights, such

access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights. The application of this paragraph shall be consistent with paragraphs 3, 4 and 5 below.

3. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that Contracting Parties, in particular those that are developing countries, which provide genetic resources are provided access to and transfer of technology which makes use of those resources, on mutually agreed terms, including technology protected by patents and other intellectual property rights, where necessary, through the provisions of Articles 20 and 21 and in accordance with international law and consistent with paragraphs 4 and 5 below.

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4. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that the private sector facilitates access to, joint development and transfer of technology referred to in paragraph 1 above for the benefit of both governmental institutions and the private sector of developing countries and in this regard shall abide by the obligations included in paragraphs 1, 2 and 3 above.

5. The Contracting Parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives.

Article 17. Exchange of Information

1. The Contracting Parties shall facilitate the exchange of information, from all publicly available sources, relevant to the conservation and sustainable use of biological diversity, taking into account the special needs of developing countries.

2. Such exchange of information shall include exchange of results of technical, scientific and socio-economic research, as well as information on training and surveying programmes, specialized knowledge, indigenous and traditional knowledge as such and in combination with the technologies referred to in Article 16, paragraph 1. It shall also, where feasible, include repatriation of information.

Article 18. Technical and Scientific Cooperation

1. The Contracting Parties shall promote international technical and scientific cooperation in the field of conservation and sustainable use of biological diversity, where necessary, through the appropriate international and national institutions.

2. Each Contracting Party shall promote technical and scientific cooperation with other Contracting Parties, in particular developing countries, in implementing this Convention, *inter alia*, through the development and implementation of national policies. In promoting such cooperation, special attention should be given to the development and strengthening of national capabilities, by means of human resources development and institution building.

3. The Conference of the Parties, at its first meeting, shall determine how to establish a clearing-house mechanism to promote and facilitate technical and scientific cooperation.

4. The Contracting Parties shall, in accordance with national legislation and policies, encourage and develop methods of cooperation for the development and use of technologies, including indigenous and traditional technologies, in pursuance of the objectives of this Convention. For this purpose, the Contracting Parties shall also promote cooperation in the training of personnel and exchange of experts.

5. The Contracting Parties shall, subject to mutual agreement, promote the establishment of joint research programmes and joint ventures for the development of technologies relevant to the objectives of this Convention.

Article 19. Handling of Biotechnology and Distribution of its Benefits

Some problems [1. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, to provide for the effective participation in biotechnological research activities by those Contracting Parties, especially developing countries, which provide the genetic resources for such research, and where feasible in such Contracting Parties.]

2. Each Contracting Party shall take all practicable measures to promote and advance priority access on a fair and equitable basis by Contracting Parties, especially developing countries, to the results and benefits arising from biotechnologies based upon genetic resources provided by those Contracting Parties. Such access shall be on mutually agreed terms.

3. The Parties shall consider the need for and modalities of a protocol setting out appropriate procedures, including, in particular, advance informed agreement, in the field of the safe transfer, handling and use of any living modified organism resulting from biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity.

4. Each Contracting Party shall, directly or by requiring any natural or legal person under its jurisdiction providing the organisms referred to in paragraph 3 above, provide any available information about the use and safety regulations required by that Contracting Party in handling such organisms, as well as any available information on the potential adverse impact of the specific organisms concerned to the Contracting Party into which those organisms are to be introduced.

Article 20. Financial Resources

1. Each Contracting Party undertakes to provide, in accordance with its capabilities, financial support and incentives in respect of those national activities which are intended to achieve the objectives of this Convention, in accordance with its national plans, priorities and programmes.

2. The developed country Parties shall provide new and additional financial resources to enable developing country Parties to meet the agreed full incremental costs to them of implementing measures which fulfil the obligations of this Convention and to benefit from its provisions and which costs are agreed between a developing country Party and the institutional structure referred to in Article 21, in accordance with policy, strategy, programme priorities and eligibility criteria and an indicative list of incremental costs established by the Conference of the Parties. Other Parties, including countries undergoing the process of transition to a market economy, may voluntarily assume the obligations of the developed country Parties. For the purpose of this Article, the Conference of the Parties, shall at its first meeting establish a list of developed country Parties and other Parties which voluntarily assume the obligations of the developed country Parties. The Conference of the Parties shall periodically review and if necessary amend the list. Contributions from other countries

and sources on a voluntary basis would also be encouraged. The implementation of these commitments shall take into account the need for adequacy, predictability and timely flow of funds and the importance of burden-sharing among the contributing Parties included in the list.

3. The developed country Parties may also provide, and developing country Parties avail themselves of, financial resources related to the implementation of this Convention through bilateral, regional and other multilateral channels.

4. The extent to which developing country Parties will effectively implement their commitments under this Convention will depend on the effective implementation by developed country Parties of their commitments under this Convention related to financial resources and transfer of technology and will take fully into account the fact that economic and social development and eradication of poverty are the first and overriding priorities of the developing country Parties.

5. The Parties shall take full account of the specific needs and special situation of least developed countries in their actions with regard to funding and transfer of technology.

6. The Contracting Parties shall also take into consideration the special conditions resulting from the dependence on, distribution and location of, biological diversity within developing country Parties, in particular small island States.

7. Consideration shall also be given to the special situation of developing countries, including those that are most environmentally vulnerable, such as those with arid and semi-arid zones, coastal and mountainous areas.

Article 21. Financial Mechanism

1. There shall be a mechanism for the provision of financial resources to developing country Parties for purposes of this Convention on a grant or concessional basis the essential elements of which are described in this Article. The mechanism shall function under the authority and guidance of, and be accountable to, the Conference of the Parties for purposes of this Convention. The operations of the mechanism shall be carried out by such institutional structure as may be decided upon by the Conference of the Parties at its first meeting. For purposes of this Convention, the Conference of the Parties shall determine the policy, strategy, programme priorities and eligibility criteria relating to the access to and utilization of such resources. The contributions shall be such as to take into account the need for predictability, adequacy and timely flow of funds referred to in Article 20 in accordance with the amount of resources needed to be decided periodically by the Conference of the Parties and the importance of burden-sharing among the contributing Parties included in the list referred to in Article 20, paragraph 2. Voluntary contributions may also be made by the developed country Parties and by other countries and sources. The mechanism shall operate within a democratic and transparent system of governance.

2. Pursuant to the objectives of this Convention, the Conference of the Parties shall at its first meeting determine the policy, strategy and programme priorities, as well as detailed criteria and guidelines for eligibility for access to and utilization of the financial resources including monitoring and evaluation on a regular basis of such utilization. The Conference of the Parties shall decide on the arrangements to give effect to paragraph 1 above after consultation with the institutional structure entrusted with the operation of the financial mechanism.

3. The Conference of the Parties shall review the effectiveness of the mechanism established under this Article, including the criteria and guidelines referred to in paragraph 2 above, not less than two years after the entry into force of this Convention and thereafter on a regular basis. Based on such review, it shall take appropriate action to improve the effectiveness of the mechanism if necessary.

4. The Contracting Parties shall consider strengthening existing financial institutions to provide financial resources for the conservation and sustainable use of biological diversity.

Article 22. Relationship with Other International Conventions

1. The provisions of this Convention shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement, except where the exercise of those rights and obligations would cause a serious damage or threat to biological diversity.

2. Contracting Parties shall implement this Convention with respect to the marine environment consistently with the rights and obligations of States under the law of the sea.

Article 23. Conference of the Parties

1. A Conference of the Parties is hereby established. The first meeting of the Conference of the Parties shall be convened by the Executive Director of the United Nations Environment Programme not later than one year after the entry into force of this Convention. Thereafter, ordinary meetings of the Conference of the Parties shall be held at regular intervals to be determined by the Conference at its first meeting.

2. Extraordinary meetings of the Conference of the Parties shall be held at such other times as may be deemed necessary by the Conference, or at the written request of any Party, provided that, within six months of the request being communicated to them by the Secretariat, it is supported by at least one third of the Parties.

3. The Conference of the Parties shall by consensus agree upon and adopt rules of procedure for itself and for any subsidiary body it may establish, as well as financial rules governing the funding of the Secretariat. At each ordinary meeting, it shall adopt a budget for the financial period until the next ordinary meeting.

4. The Conference of the Parties shall keep under review the implementation of this Convention, and, for this purpose, shall:

(a) Establish the form and the intervals for transmitting the information to be submitted in accordance with Article 26 and consider such information as well as reports submitted by any subsidiary body;

(b) Review scientific, technical and technological advice on biological diversity provided in accordance with Article 25;

(c) Consider and adopt, as required, protocols in accordance with Article 28;

(d) Consider and adopt, as required, in accordance with Articles 29 and 30, amendments to this Convention and its annexes;

(e) Consider amendments to any protocol, as well as to any annexes thereto, and, if so decided, recommend their adoption to the parties to the protocol concerned;

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(f) Consider and adopt, as required, in accordance with Article 30, additional annexes to this Convention;

(g) Establish such subsidiary bodies, particularly to provide scientific and technical advice, as are deemed necessary for the implementation of this Convention;

(h) Contact, through the Secretariat, the executive bodies of conventions dealing with matters covered by this Convention with a view to establishing appropriate forms of cooperation with them; and

(i) Consider and undertake any additional action that may be required for the achievement of the purposes of this Convention in the light of experience gained in its operation.

5. The United Nations, its specialized agencies and the International Atomic Energy Agency, as well as any State not Party to this Convention, may be represented as observers at meetings of the Conference of the Parties. Any other body or agency, whether governmental or non-governmental, qualified in fields relating to conservation and sustainable use of biological diversity, which has informed the Secretariat of its wish to be represented as an observer at a meeting of the Conference of the Parties, may be admitted unless at least one third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure adopted by the Conference of the Parties.

Article 24. Secretariat

1. A secretariat is hereby established. Its functions shall be:

(a) To arrange for and service meetings of the Conference of the Parties provided for in Article 23;

(b) To perform the functions assigned to it by any protocol;

(c) To prepare reports on the execution of its functions under this Convention and present them to the Conference of the Parties;

(d) To coordinate with other relevant international bodies and, in particular to enter into such administrative and contractual arrangements as may be required for the effective discharge of its functions; and

(e) To perform such other functions as may be determined by the Conference of the Parties.

2. At its first ordinary meeting, the Conference of the Parties shall designate the secretariat from amongst those existing competent international organizations which have signified their willingness to carry out the secretariat functions under this Convention.

Article 25. Subsidiary Body on Scientific, Technical and Technological Advice

1. A subsidiary body for the provision of scientific, technical and technological advice is hereby established to provide the Conference of the Parties and, as appropriate, its other subsidiary bodies with timely advice relating to the implementation of this Convention. This body shall be open to participation by all Parties and shall be multidisciplinary. It shall comprise government representatives competent in the relevant field of expertise. It shall report regularly to the Conference of the Parties on all aspects of its work.

2. Under the authority of and in accordance with guidelines laid down by the Conference of the Parties, and upon its request, this body shall:

(a) Provide scientific and technical assessments of the status of biological diversity;

(b) Prepare scientific and technical assessments of the effects of types of measures taken in accordance with the provisions of this Convention;

(c) Identify innovative, efficient and state-of-the-art technologies and know-how relating to the conservation and sustainable use of biological diversity and advise on the ways and means of promoting development and/or transferring such technologies;

(d) Provide advice on scientific programmes and international cooperation in research and development related to conservation and sustainable use of biological diversity; and

(e) Respond to scientific, technical, technological and methodological questions that the Conference of the Parties and its subsidiary bodies may put to the body.

3. The functions, terms of reference, organization and operation of this body may be further elaborated by the Conference of the Parties.

Article 26. Reports

Each Contracting Party shall, at intervals to be determined by the Conference of the Parties, present to the Conference of the Parties, reports on measures which it has taken for the implementation of the provisions of this Convention and their effectiveness in meeting the objectives of this Convention.

Article 27. Settlement of Disputes

1. In the event of a dispute between Contracting Parties concerning the interpretation or application of this Convention, the parties concerned shall seek solution by negotiation.

2. If the parties concerned cannot reach agreement by negotiation, they may jointly seek the good offices of, or request mediation by, a third party.

3. When ratifying, accepting, approving or acceding to this Convention, or at any time thereafter, a State or regional economic integration organization may declare in writing to the Depositary that for a dispute not resolved in accordance with paragraph 1 or paragraph 2 above, it accepts one or both of the following means of dispute settlement as compulsory:

(a) Arbitration in accordance with the procedure laid down in Part 1 of Annex II;

(b) Submission of the dispute to the International Court of Justice.

4. If the parties to the dispute have not, in accordance with paragraph 3 above, accepted the same or any procedure, the dispute shall be submitted to conciliation in accordance with Part 2 of Annex II unless the parties otherwise agree.

5. The provisions of this Article shall apply with respect to any protocol except as otherwise provided in the protocol concerned.

Article 28. Adoption of Protocols

1. The Contracting Parties shall cooperate in the formulation and adoption of protocols to this Convention.
2. Protocols shall be adopted at a meeting of the Conference of the Parties.
3. The text of any proposed protocol shall be communicated to the Contracting Parties by the Secretariat at least six months before such a meeting.

Article 29. Amendment of the Convention or Protocols

1. Amendments to this Convention may be proposed by any Contracting Party. Amendments to any protocol may be proposed by any Party to that protocol.
2. Amendments to this Convention shall be adopted at a meeting of the Conference of the Parties. Amendments to any protocol shall be adopted at a meeting of the Parties to the Protocol in question. The text of any proposed amendment to this Convention or to any protocol, except as may otherwise be provided in such protocol, shall be communicated to the Parties to the instrument in question by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate proposed amendments to the signatories to this Convention for information.
3. The Parties shall make every effort to reach agreement on any proposed amendment to this Convention or to any protocol by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a two-third majority vote of the Parties to the instrument in question present and voting at the meeting, and shall be submitted by the Depositary to all Parties for ratification, acceptance or approval.
4. Ratification, acceptance or approval of amendments shall be notified to the Depositary in writing. Amendments adopted in accordance with paragraph 3 above shall enter into force among Parties having accepted them on the ninetieth day after the deposit of instruments of ratification, acceptance or approval by at least two thirds of the Contracting Parties to this Convention or of the Parties to the protocol concerned, except as may otherwise be provided in such protocol. Thereafter the amendments shall enter into force for any other Party on the ninetieth day after that Party deposits its instrument of ratification, acceptance or approval of the amendments.
5. For the purposes of this Article, "Parties present and voting" means Parties present and casting an affirmative or negative vote.

Article 30. Adoption and Amendment of Annexes

1. The annexes to this Convention or to any protocol shall form an integral part of the Convention or of such protocol, as the case may be, and, unless expressly provided otherwise, a reference to this Convention or its protocols constitutes at the same time a reference to any annexes thereto. Such annexes shall be restricted to procedural, scientific, technical and administrative matters.

2. Except as may be otherwise provided in any protocol with respect to its annexes, the following procedure shall apply to the proposal, adoption and entry into force of additional annexes to this Convention or of annexes to any protocol:

(a) Annexes to this Convention or to any protocol shall be proposed and adopted according to the procedure laid down in Article 29;

(b) Any Party that is unable to approve an additional annex to this Convention or an annex to any protocol to which it is Party shall so notify the Depositary, in writing, within one year from the date of the communication of the adoption by the Depositary. The Depositary shall without delay notify all Parties of any such notification received. A Party may at any time withdraw a previous declaration of objection and the annexes shall thereupon enter into force for that Party subject to subparagraph (c) below;

(c) On the expiry of one year from the date of the communication of the adoption by the Depositary, the annex shall enter into force for all Parties to this Convention or to any protocol concerned which have not submitted a notification in accordance with the provisions of subparagraph (b) above.

3. The proposal, adoption and entry into force of amendments to annexes to this Convention or to any protocol shall be subject to the same procedure as for the proposal, adoption and entry into force of annexes to the Convention or annexes to any protocol.

4. If an additional annex or an amendment to an annex is related to an amendment to this Convention or to any protocol, the additional annex or amendment shall not enter into force until such time as the amendment to the Convention or to the protocol concerned enters into force.

Article 31. Right to Vote

1. Except as provided for in paragraph 2 below, each Contracting Party to this Convention or to any protocol shall have one vote.

2. Regional economic integration organizations, in matters within their competence, shall exercise their right to vote with a number of votes equal to the number of their member States which are Contracting Parties to this Convention or the relevant protocol. Such organizations shall not exercise their right to vote if their member States exercise theirs, and vice versa.

Article 32. Relationship between this Convention and Its Protocols

1. A State or a regional economic integration organization may not become a Party to a protocol unless it is, or becomes at the same time, a Contracting Party to this Convention.

2. Decisions under any protocol shall be taken only by the Parties to the protocol concerned. Any Contracting Party that has not ratified, accepted or approved a protocol may participate as an observer in any meeting of the parties to that protocol.

Article 33. Signature

This Convention shall be open for signature at Rio de Janeiro by all States and any regional economic integration organization from 5 June 1992 until 14 June 1992, and at the United Nations Headquarters in New York from 15 June 1992 to 4 June 1993.

Article 34. Ratification, Acceptance or Approval

1. This Convention and any protocol shall be subject to ratification, acceptance or approval by States and by regional economic integration organizations. Instruments of ratification, acceptance or approval shall be deposited with the Depositary.
2. Any organization referred to in paragraph 1 above which becomes a Contracting Party to this Convention or any protocol without any of its member States being a Contracting Party shall be bound by all the obligations under the Convention or the protocol, as the case may be. In the case of such organizations, one or more of whose member States is a Contracting Party to this Convention or relevant protocol, the organization and its member States shall decide on their respective responsibilities for the performance of their obligations under the Convention or protocol, as the case may be. In such cases, the organization and the member States shall not be entitled to exercise rights under the Convention or relevant protocol concurrently.
3. In their instruments of ratification, acceptance or approval, the organizations referred to in paragraph 1 above shall declare the extent of their competence with respect to the matters governed by the Convention or the relevant protocol. These organizations shall also inform the Depositary of any relevant modification in the extent of their competence.

Article 35. Accession

1. This Convention and any protocol shall be open for accession by States and by regional economic integration organizations from the date on which the Convention or the protocol concerned is closed for signature. The instruments of accession shall be deposited with the Depositary.
2. In their instruments of accession, the organizations referred to in paragraph 1 above shall declare the extent of their competence with respect to the matters governed by the Convention or the relevant protocol. These organizations shall also inform the Depositary of any relevant modification in the extent of their competence.
3. The provisions of Article 34, paragraph 2, shall apply to regional economic integration organizations which accede to this Convention or any protocol.

Article 36. Entry Into Force

1. This Convention shall enter into force on the ninetieth day after the date of deposit of the thirtieth instrument of ratification, acceptance, approval or accession.
2. Any protocol shall enter into force on the ninetieth day after the date of deposit of the number of instruments of ratification, acceptance, approval or accession, specified in that protocol, has been deposited.
3. For each Contracting Party which ratifies, accepts or approves this Convention or accedes thereto after the deposit of the thirtieth instrument of ratification, acceptance, approval or accession, it shall enter into force on the ninetieth day after the date of deposit by such Contracting Party of its instrument of ratification, acceptance, approval or accession.
4. Any protocol, except as otherwise provided in such protocol, shall enter into force for a Contracting Party that ratifies, accepts or approves that protocol or accedes thereto after its entry into force pursuant to paragraph 2 above, on the ninetieth day after the date on which that

Contracting Party deposits its instrument of ratification, acceptance, approval or accession, or on the date on which this Convention enters into force for that Contracting Party, whichever shall be the later.

5. For the purposes of paragraphs 1 and 2 above, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by member States of such organization.

Article 37. Reservations

No reservations may be made to this Convention.

Article 38. Withdrawals

1. At any time after two years from the date on which this Convention has entered into force for a Contracting Party, that Contracting Party may withdraw from the Convention by giving written notification to the Depositary.

2. Any such withdrawal shall take place upon expiry of one year after the date of its receipt by the Depositary, or on such later date as may be specified in the notification of the withdrawal.

3. Any Contracting Party which withdraws from this Convention shall be considered as also having withdrawn from any protocol to which it is party.

Article 39. Financial Interim Arrangements

Provided that it has been fully restructured in accordance with the requirements of Article 21, the Global Environment Facility of the United Nations Development Programme, the United Nations Environment Programme and the International Bank for Reconstruction and Development shall be the institutional structure referred to in Article 21 on an interim basis, for the period between the entry into force of this Convention and the first meeting of the Conference of the Parties or until the Conference of the Parties decides which institutional structure will be designated in accordance with Article 21.

Article 40. Secretariat Interim Arrangements

The secretariat to be provided by the Executive Director of the United Nations Environment Programme shall be the secretariat referred to in Article 24, paragraph 2, on an interim basis for the period between the entry into force of this Convention and the first meeting of the Conference of the Parties.

Article 41. Depositary

The Secretary-General of the United Nations shall assume the functions of Depositary of this Convention and any protocols.

Article 42. Authentic Texts

The original of this Convention, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.

IN WITNESS WHEREOF the undersigned, being duly authorized to that effect, have signed this Convention.

Done at Rio de Janeiro on this fifth day of June, one thousand nine hundred and ninety-two.

Annex I

IDENTIFICATION AND MONITORING

1. Ecosystems and habitats: containing high diversity, large numbers of endemic or threatened species, or wilderness; required by migratory species; of social, economic, cultural or scientific importance; or, which are representative, unique or associated with key evolutionary or other biological processes;
2. Species and communities which are: threatened; wild relatives of domesticated or cultivated species; of medicinal, agricultural or other economic value; or social, scientific or cultural importance; or importance for research into the conservation and sustainable use of biological diversity, such as indicator species; and
3. Described genomes and genes of social, scientific or economic importance.

Annex II

Part 1

ARBITRATION

Article 1

The claimant party shall notify the secretariat that the parties are referring a dispute to arbitration pursuant to Article 27. The notification shall state the subject-matter of arbitration and include, in particular, the articles of the Convention or the protocol, the interpretation or application of which are at issue. If the parties do not agree on the subject matter of the dispute before the President of the tribunal is designated, the arbitral tribunal shall determine the subject matter. The secretariat shall forward the information thus received to all Contracting Parties to this Convention or to the protocol concerned.

Article 2

1. In disputes between two parties, the arbitral tribunal shall consist of three members. Each of the parties to the dispute shall appoint an arbitrator and the two arbitrators so appointed shall designate by common agreement the third arbitrator who shall be the President of the tribunal. The latter shall not be a national of one of the parties to the dispute, nor have his or her usual place of residence in the territory of one of these parties, nor be employed by any of them, nor have dealt with the case in any other capacity.

2. In disputes between more than two parties, parties in the same interest shall appoint one arbitrator jointly by agreement.

3. Any vacancy shall be filled in the manner prescribed for the initial appointment.

Article 3

1. If the President of the arbitral tribunal has not been designated within two months of the appointment of the second arbitrator, the Secretary-General of the United Nations shall, at the request of a party, designate the President within a further two-month period.

2. If one of the parties to the dispute does not appoint an arbitrator within two months of receipt of the request, the other party may inform the Secretary-General who shall make the designation within a further two-month period.

Article 4

The arbitral tribunal shall render its decisions in accordance with the provisions of this Convention, any protocols concerned, and international law.

Article 5

Unless the parties to the dispute otherwise agree, the arbitral tribunal shall determine its own rules of procedure.

Article 6

The arbitral tribunal may, at the request of one of the parties, recommend essential interim measures of protection.

Article 7

The parties to the dispute shall facilitate the work of the arbitral tribunal and, in particular, using all means at their disposal, shall:

(a) Provide it with all relevant documents, information and facilities; and

(b) Enable it, when necessary, to call witnesses or experts and receive their evidence.

Article 8

The parties and the arbitrators are under an obligation to protect the confidentiality of any information they receive in confidence during the proceedings of the arbitral tribunal.

Article 9

Unless the arbitral tribunal determines otherwise because of the particular circumstances of the case, the costs of the tribunal shall be borne by the parties to the dispute in equal shares. The tribunal shall keep a record of all its costs, and shall furnish a final statement thereof to the parties.

Article 10

Any Contracting Party that has an interest of a legal nature in the subject-matter of the dispute which may be affected by the decision in the case, may intervene in the proceedings with the consent of the tribunal.

Article 11

The tribunal may hear and determine counterclaims arising directly out of the subject-matter of the dispute.

Article 12

Decisions both on procedure and substance of the arbitral tribunal shall be taken by a majority vote of its members.

Article 13

If one of the parties to the dispute does not appear before the arbitral tribunal or fails to defend its case, the other party may request the tribunal to continue the proceedings and to make its award. Absence of a party or a failure of a party to defend its case shall not constitute a bar to the proceedings. Before rendering its final decision, the arbitral tribunal must satisfy itself that the claim is well founded in fact and law.

Article 14

The tribunal shall render its final decision within five months of the date on which it is fully constituted unless it finds it necessary to extend the time-limit for a period which should not exceed five more months.

Article 15

The final decision of the arbitral tribunal shall be confined to the subject-matter of the dispute and shall state the reasons on which it is

based. It shall contain the names of the members who have participated and the date of the final decision. Any member of the tribunal may attach a separate or dissenting opinion to the final decision.

Article 16

The award shall be binding on the parties to the dispute. It shall be without appeal unless the parties to the dispute have agreed in advance to an appellate procedure.

Article 17

Any controversy which may arise between the parties to the dispute as regards the interpretation or manner of implementation of the final decision may be submitted by either party for decision to the arbitral tribunal which rendered it.

Part 2

CONCILIATION

Article 1

A conciliation commission shall be created upon the request of one of the parties to the dispute. The commission shall, unless the parties otherwise agree, be composed of five members, two appointed by each Party concerned and a President chosen jointly by those members.

Article 2

In disputes between more than two parties, parties in the same interest shall appoint their members of the commission jointly by agreement. Where two or more parties have separate interests or there is a disagreement as to whether they are of the same interest, they shall appoint their members separately.

Article 3

If any appointments by the parties are not made within two months of the date of the request to create a conciliation commission, the Secretary-General of the United Nations shall, if asked to do so by the party that made the request, make those appointments within a further two-month period.

Article 4

If a President of the conciliation commission has not been chosen within two months of the last of the members of the commission being appointed, the Secretary-General of the United Nations shall, if asked to do so by a party, designate a President within a further two-month period.

Article 5

The conciliation commission shall take its decisions by majority vote of its members. It shall, unless the parties to the dispute otherwise agree, determine its own procedure. It shall render a proposal for resolution of the dispute, which the parties shall consider in good faith.

Article 6

A disagreement as to whether the conciliation commission has competence shall be decided by the commission.

CONVENTION ON BIOLOGICAL DIVERSITY

5 JUNE 1992

COOPERATION BETWEEN
DEVELOPED AND DEVELOPING
COUNTRIES IN BIOLOGICAL
DIVERSITY CONSERVATION
TECHNOLOGIES PROTECTED
THROUGH INTELLECTUAL
PROPERTY RIGHTS

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Often, intellectual property rights (IPR's) are considered a kind of obstacle for the transfer of technology related to the conservation of biological diversity. During the last two Convention negotiating sessions held in Nairobi, the main item which called problems on this point were, summing up:

- Access to genetic resources.
- Access to and transfer of technology.
- Exchange of information.
- Technical and scientific cooperation.
- Biotechnology handling and share of benefits.

Developed countries introduced at that time, some amendments to the original text, to preserve the rights of the IPR's holders for the automatic transfers of technology to private firms or public bodies of developing countries. This exchange of information, access to genetic resources and access and/or transfer of technology, was agreed to be based on mutually agreed terms. That means in practice, that private circles of developed countries may freely negotiate preferential flows of technology and/or information to developing countries, on matters related to the conservation of biological diversity. Financial mechanisms provided by developed countries would encourage cooperation in this field not only between public, but also, private sectors.

The role to play at this point by patent offices may become crucial at a certain level. Most of patented technology only remains secret in its legal life, during the application period and in most of the countries, only in part of this period. Once the patent is granted, or the application is published, there is an automatic disclosure of its content, and a free accessibility to it. Information, at this stage, may be freely exchanged and/or transferred to developing countries, with minimal cost. Also search reports on matters concerning conservation of biological diversity may be performed by the patent offices of developed countries at reduced prices, or Spanish patent as Trade Marks Office does since years in any technical sector, in the context of cooperation with South American countries which had signed agreements in this sense with us in spite of previous assessments, to fully use a patent, a negotiation with the patent holder has to be previously made on know-how, marketing, to put a competitive produce into the market.

These are some ideas of the role to be played by the public bodies which are in charge of the administration of IPR's, mainly the patent offices, in order to assure full cooperation between developed and developing countries, on conservation of biological matters. They only try to illustrate some new perspectives always based on the mutual problem of the technical property legislation and the goals of the biological diversity conservation Convention.

*This paper has been produced without formal editing.

are ally defined as contracts between inventors society. Each part must fulfill some commitments. The society must guaranty to the inventor the monopoly in the exploitation of his invention. For this reason we talk of *property* rights. On the other hand, the inventor must disclose his invention. This part of the contract is clearly related with the continuous growing up of the common technical knowledge, that in the field of IPR's is called as state of the art.

Thus, as consequence of the previous reasoning, IPR's are useful tools to keep on going the innovation process inherent to many industrial activities. Within this context, new inventions arising from any human activity, including environment, biological legal protection was not provided. In fact, in some circles a threatened future is foreseen for biotechnology innovations, for instead, if patent laws do not became rapidly adapted to this arising sector (EEC Commission Directive Draft Proposal for the Protection of Biotechnological Inventions COM88-496final-SYN159, October, 1988).

Following with the example of the Biotechnology, this new industrial sector offers opportunities for global partnerships, especially between countries rich in biological resources (most of the developing countries) and others which have developed technologies to transform those resources in order to serve the needs of sustainable development (United Nations General Assembly document A/CONF.151/PC/100/Add. 27). Patent and other IPR's designed to protect technology (Plant Variety Certificates, Utility Models, etc.), support subsequently the innovation process and without its role in the legal framework, science and technology may slow down considerably. Without a satisfactory IPR's system there would be also important obstacles to the diffusion of the information because most of the inventions would remain secret. The alternative most widely used to the IPR's is secrecy and dealing with secrets, the access to and/or the transfer of knowledge is even feasible.

Biodiversity includes variety and variability of genes, on our planet and provides an abundant and essential supply of indispensable goods and services. To resolve the most critical problem for the conservation of biodiversity will require a major spirit in thinking at all levels of decision-making, supported by a commitment to stepping up levels of human, financial, and other resources, especially for capacity building in the developing countries (United Nations General Assembly Doc. A CONF. 151/PC/100/Add.20). In this sense the biodiversity conservation is a whole human task and should serve to balance the differences between developed countries which depend on it for future projects on research and development (R&D) and developing countries which have the former responsibility of conservation because they have the resources inside their own territories. The urgency in adopting measures, an estimated 25 percent of the world's species present in the mid-1980's may be extinct by the year 2015 or soon after (Biodiversity Country Studies, UNEP Inf.1, Nairobi, 23 April 1992), has lead to the signature in

Rio de Janeiro in June 1992 of the Convention on the Conservation of Biological Diversity. This new born has started walking and in some circles, IPR's has been shown as threatened obstacles for the implementation of the convention.

This paper is going to serve the opposite, that is, IPR's not only constitute any serious obstacle for the Convention to come fully into force, to the contrary it may help in certain sense, with the active role of the patent office, to spread out technologies and information contained in patent documents.

A non exhaustive analysis of the articles of the Biological Diversity Conservation Convention detects some areas of IPR's influence in the implementation of the text and where the role of patent offices in cooperation may be widely open. These areas are covered mainly by articles 15 to 19 of the convention and summing up are the following:

- A. Access to genetic resources.
- B. Access to and transfer of technology.
- C. Exchange of information.
- D. Technical and scientific cooperation.
- D. Distribution of benefits.

A. Access to Genetic Resources Protected by IPR's

I know this specific article has not been thought to talk about IPR's. The article intends to assure access to genetic resources because facilitating this access, generation of biodiversity is also assured. This is the reason why I entitle this point "Access to genetic resources protected by IPR's". I know I am only talking about a small part of the problem but, probably is the worst one. Genetic resources not protected by IPR's are accessible after negotiation between contracting parties on mutually agreed terms. But what happen when, for instead, once those genetic resources are obtained by a firm of developed country, from a territory of a developing country, the genetic resources are genetically improved and protected through patents? The access to the genetic material developed and patented is possible?

As general principle, access to any patented subject is only restricted during a short period of time, until a first publication. Normally the first one to be published is the application and usually takes places after 18 months from the filing date of the first application. However, some countries, like the United States of America, only make the first publication after granting the patent. In this particular case, the period when the patent remains secret, became a bit longer (24-36 months). Once the publication takes place, the invention is disclosed, and any one may consult it or obtain copies of it. There is only an exception to this general principle, patents which are declared secret during the examination proceeding due, generally, to defense or security national policies. These patents are of no statistical significance.

The article of the Biodiversity Convention rules this subject of the access to genetic resources. The aim of this article is to encourage contracting parties to create conditions to facilitate access on the basis of:

- Recognizing the sovereignty of each nation over its natural resources.
- The access shall be on mutually agreed terms between parties.
- Sharing of results and/or benefits of the R&D made from the genetic resources.

A special mention is made about the restrictions that run against the objectives of the Convention. In this sense IPR's may be considered as such a sort of restrictions. I must say at this particular point that IPR's were designed to act as useful and effective tools of a free market economy and they have been operating correctly during many years. Obviously IPR's since they were created have fully-developed in parallel to the new technologies and the economy itself. An objective of the contracting parties and of the Convention itself should be, from my point of view, to make compatible two instruments, IPR's by one side, and Biodiversity Convention by the other, designed for completely different purposes and that must coexist and, in certain fields, enhance their goals.

Before coming into details, I must distinguish between access to genes or DNA sequences as such and access to living matter containing those genes or DNA sequences (microorganisms, plants, animals, etc.).

A-1 Access to genes or DNA sequences as such, protected by IPR's

Recently the patentability of human genes isolated, has been widely discussed between the patent offices from the United States, Japan and the European patent office. The problem was raised by the patent applications for human DNA sequences isolated by the American laboratory of Dr. Venters. The actual state of discussions (Commission of the European Communities. Committee 113, Session 274/92) tends to consider as suitable for patentability only the gene and/or sequences whose function was known. This transactional solution solves, for the time being, the problem raised by the automatic sequencing of DNA material due to the technical development of DNA sequencers achieved recently.

The problem has also an ethical component. Many people wonder if the genetic heritage of a human being can be owned or not by private circles.

When we referred to animal or plant isolated genes of DNA sequences (when I talk about DNA I am also talking about their problem which is similar although the ethical component is weaker in these cases.

At this stage I may conclude that meanwhile the patentability of this kind of inventions was not definitively set up, its influence on the implementation of the Biodiversity convention is to be seen. In any case, and as general

statement that may also serve for the following chapters, cooperation between countries rich in animal and plant genetic resources and countries which have developed isolation and sequencing technologies of gene and/or DNA sequences must guarantee access to such genetic materials and reciprocal share of benefits resulting from those materials, in the way of scientific cooperation, including training programmes for scientific and technical staff, exchange of information, sharing the ownership or licensing of IPR's derived from the invention or sharing money benefits if the invention is put on the market.

A-2 Access to living matter protected by IPR's

Once again I must divide living matter into three categories: microorganisms, in general, plants and animals. This division is not intended to be based on any taxonomy and is only made from the point of view of the IPR's problems existing in each category.

A.23a. Access to animals related inventions protected by IPR's

At the moment there is not any IPR's for races of animals. They are excluded from patentability in most of existing patent laws. However, recently some patent applications have been deposited, mainly at USPTMO (United States Patent on Trade Marks Offices) and at the EPO (European Patent Office). The applications mentioned above are related to transgenic animals, although some other patents about breeding methods which include surgical manipulations (embryo transfers) have been also applied. Until the last decade, the inventions related to animals were restricted to essentially biological methods of breeding to obtain new races of animals (both, methods and races are express excluded from patentability). With the arrival of Biotechnology on Genetic Engineering to the animal breeding techniques, these inventions claimed for an effective protection which allow the sector to keep on developing.

No definitive decisions have been made in this respect but the tendency is to consider these inventions as suitable for patents. Future cooperation at this point between countries with autochthonous races adapted to certain biotopes, and countries with technologies to incorporate the genes where those features are located into other commercial races of animals, shall be necessary. At this point a good solution could be the creation in developing countries of experimental forms for breeding of new animal races commercially more profitable, from local races, but always with conservation programmes of the native species. In fact this solution is already subjected in article 15 itself when in paragraph 6 we talk about the location of research activities in the contracting parties.

A.2.b. Access to plants protected by IPR's

Plants may be protected by patents in certain cases and by Breeder's Rights which are widely used, in others. Usually patents cover biotechnology and genetic engineering inventions and breeder's rights cover more traditional methods, as selection, for example. In fact, in most of the patent laws, traditional breeding methods and the varieties obtained thereof, are expressly considered as non patentable. Concerning access to plants protected through patents, every general principle previously said for other subjects is applicable. FAO conference of November 1989 opposed to any restriction to the access to germ plasm, protected by IPR's or not. In fact, unfair situations occur, like restrictions, due to IPR's, to local populations, origin of germ plasm developed by biotechnology and protected later on. In relation to access to plant varieties protected by Breeder's Rights, the International Union for the Protection of New Varieties of Plants (UPOV), has recently approved a new draft of its Convention (CUPOV) (Diplomatic Conference for the Revision of the International Convention for the Protection of New Varieties of Plants, Doc.DC/91/138). No specific provisions have been adopted about the access itself but the scope of protection of this right covers production of reproduction, conditioning, selling, export/importing, etc. of the plant Variety's propagating material. There is however some exception to the Breeder's right which may be important to implement the Biodiversity Convention. These exceptions are:

- Acts without commercial purposes.
- Acts done for experimental purposes.
- Acts done for the purpose of breeding other varieties derived from the protected ones.

In my opinion these exceptions make compatible the existence of these two bodies of law: CUPOV and Biodiversity Convention. There is also an exemption traditionally accepted, the so called "Farmers privilege". This privilege allows farmers to use their own harvested material as seeds for the next season, but only inside the limits of their own properties. The importance of maintaining this privilege for developing countries is crucial because farmers in these countries have no means to purchase seeds every year, as has been outlined by, among others, The Keystone Center (Oslo Rapport on "Security and sustainable use of plant genetic resources", 1991). The recent CUPOV revision leaves member countries to keep this exemption as such or to restrict it, to avoid the extended abuse of reselling reused seeds. The Keystone Center recommends developing countries which are members of CUPOV or are thinking of joining that Convention, to keep farmer's privilege and do not restrict this traditional right, very advantageous for

small farmers and developing economics. This International center also warns about the risks of the extension of breeder's rights and plant patents and their negative influence on traditional selection breeders which maintain an important biological diversity as result of their traditional practices. It recognizes, however, the substantial role of IPR's system to stimulate the innovation process in the plant research. From the point of view of biodiversity, strictly, CUPOV promotes development of new varieties through breeders and farmers' exemptions. Breeder's exemption consists in the utilization without restrictions of the protected varieties as source of initial variability in the selection processes for obtaining new varieties. Only in the case of varieties essentially derived, the holder of the former protected variety has some rights over the new one. This exemption is consistent with the aim of CUPOV, this is to encourage the creation of plant varieties by enhancing its legal protection but without blocking generation of new varieties. Farmer's exception or farmer's privilege contribute to biodiversity in plant field by allowing farmers, inside their properties, to reuse seeds obtained in their harvests and to continue selecting varieties in traditional fashion. On the other hand the uniformity requirement may restrict the use of native varieties adapted to local conditions, genetically more diverse. In effect the four main requirements plant varieties have to meet to be granted with a breeder's right are: novelty, distinctiveness, uniformity and stability. Uniformity criteria is needed to assure what is really being protected but may run against the creation of biodiversity.

Plant patents are seen by some authors as restrictive not only for the access to plant genetic resources, but also for their use. New plants coming from biotechnology research tend to substitute traditional varieties in agriculture, which are abandoned, diminishing biodiversity therefore. Plant patents do not recognise any breeder or farmer's exceptions for the time being. At this point patents do not act in a comparable way to breeder's rights. From the point of view of the strength of the right, may be considered as more powerful instruments of protection than breeder's right. The encouraging effects in searching new varieties through patents is not achieved throughout exceptions to the monopoly conferred. The encouraging action of patents is based on their effectiveness to fully legally protect inventions, moving investments to fields in the confidence of the security legal frame offered. In any case there are also exceptions in patent law which allow the use of patented plants but only for experimental research. In the draft text of the EC directive on "Legal protection of biotechnological inventions", not approved yet, there also were some mechanisms to allow the creation of new varieties of plants from patented inventions (genes, plant cells or tissues, etc.). In fact a dependency licensing system was laid out to permit the obtention of new varieties of plants which would not be possible without the infringement of a previous patent. The directive has recently been discussed by the European Parliament and sent back to the commission to introduce in

the draft text, among other amendments, the farmer's privilege principle (Europe, *Marcredi ler Juillet 1992*, no. 5762 pg:14). As we may observe, different right systems, as patent laws, breeder rights and, in certain ways, also Biodiversity Convention, tend with time, to harmonise in many different experts.

A.2.c. Access to microorganisms protected by IPR's

The term microorganism, from the point of view of IPR's, is considered as any living matter that may be deposited in recognized institutions to fulfill the requirement of description sufficiency. In the patent granting procedure, applications dealing with microbiology, biotechnology, genetic engineering, processes and/or products, often have to make a deposit of the material mentioned in the patent document in an International Authority. The deposit requirement is complementary of the written description of the embodiment of the invention that very often results insufficient when living matter is involved.

Therefore any deposit shall be linked to a patent application. The term microorganism includes: bacteria, fungi, algae, protozoa, plants, seeds, animal embryos, tissue cultures, cells, plasmids, etc. The functioning of the International Authorities recognized by the World Intellectual Property Organization (WIPO), and the proceeding to deposit and to access to samples, are ruled in the so called Budapest Treaty (WIPO, Geneva 1982). The access to the samples deposited is permitted, once the patent application has been published, to anybody who meet the following requirements:

- Not communicate to third parties any information about the culture obtained.
- Use the culture only for experimental purposes.

The requirements are valid only if the patent is in force but not if it became rejected, expired, abandoned, etc. Before publication of the patent application only are allowed to obtain samples of the deposited material, those legitimated by some other patent right presumably infringed or, in some legislations anyone but through a third person called "an expert" (European Patent Convention Rule 28).

As you may easily see, the access is only hardly restricted in consonance with the secrecy of patent applications, until first publication occurs. Once the publication takes place, access to samples deposited is widely open.

Access to and Transfer of Technology

Let me first point out that the convention only mentions the access to and transfer of technology, environmentally sound and related to the conservation of biological diversity.

This particular subject is treated in article 16 of the Convention. Reading the article we may find frequently mentioned references to IPR's. Articles

15 and 16 to 19 are, in a certain sense, the two plates of a balance. A balance that was clearly laid down in the Convention's preamble and objectives (Art. 1). In the plate of article 15 the Convention assures access to genetic resources as a substantial mechanism to preserve and enhance the Biological Diversity. In the other arm of the balance, articles 16 to 19 set up the compensation to be paid by the contracting parties using such genetic resources. Compensation has several modalities: transfer of technology (article 16), exchange of information (article 17), technical and scientific cooperation (article 18) and sharing of benefits (article 19). Why are there so many references to IPR's in article 16 and none in the rest of articles dealing with compensations to satisfy the use of genetic resources? The answer is found in the aim of IPR's itself, to protect technology developed to be used by the industry. This is a crucial point to understand the role IPR's are going to play in the effective implementation of the biodiversity convention. Although some IPR's are owned by public institutions (public research centres, universities, etc.) or by the governments themselves, most of them belong to the private sector. So, the only way to involve the private sector in the Biodiversity Convention shall be respecting IPR's. From the point of view of access to and transfer of technology owned by public bodies, does not matter if it is protected by IPR's or not, the obstacles for the implementation of the convention in this particular problem will disappear with the political will of such governments. The conflict will arise when these same governments treat to oblige to their private sectors to take decisions in technology access and/or transfer matters which were not environmentally-sound. The only way to allow private sectors to the spirit of the Convention is to take measures to encourage it to cooperate, but respecting the playground rules where this private sector moves, develops and creates wealth, which include an effective protection of IPR's. In this respect, balancing the situation stated in article 15, it is important that also in article 16, any agreement or compromise between contracting parties shall be done on mutually agreed terms. The encouraging measures probably have to include financial mechanisms (through the provisions of articles 20 and 21 of the Convention) to avoid blocking of transfer when negotiations were not successfully finished. Financial items were broadly discussed in May at the Joint Development/Environment Council of the European Communities (Doc. 6273/92 ENV121 ONU13). It was generally agreed that additional external funding for sustainable development and for action to combat global environmental problems shall be provided by developed countries on equitable burden sharing basis. The most common instrument to transfer technology protected by IPR's are licenses. If such license must be preferential, exclusive, concessional, most favourable, whatever term we wish to add to the list, shall be to the free negotiating process between contracting parties. If commercial mechanisms alone do act adequately, administrative or policy measures should be taken by contracting parties to assure the implementa-

tion of the convention at this point. Where necessary, financial provisions according to articles 20 and 21 could also be used to purchase, by government of developed countries, patents or non exclusive licenses to be offered to developing countries providing genetic resources, as part of aid packages.

The development of national technologies, endogenous scientific and technological capabilities in developing countries, together with the strengthening of Industrial Property policies, would promote technology transfer. Transfer of environmentally sound technology has to intensify not only between developed and developing countries but among developing countries too.

Agenda 21 also deals with this subject. Technology transfer process (including the state-of-the-art technology and related know-how) should entail a system involving governments, private sector and research and development facilities.

What may be the role to be played by patent offices and offices in general, in charge of the administration of IPR's in the access to and/or transfer of environmentally-sound technology? First of all the patent offices in their daily work are facilitating the access to technology by means of routine tasks

- classifying the documents according to the international patent classification (IPC STD addition WIPO) The classification facilitates the ordering and recovery of patents on each industrial sector.
- systemizing patent documents in collections by numerical order, by classification, by country, etc.
- introducing patents in data bases, Compact Disk-Read Only Memory (CD-ROMs), microfiches, etc., different supports to facilitate consultation in different equipments.
- translating the same family of patent documents to different languages.
- producing monographs, search reports, technological surveillance, etc.

This way patent documents are systemized, classified, ordered, available in different languages and supports, and ones first publication occurs, are in the public domain. There are features which distinguish patent information from other sources of knowledge, especially traditional information, like native methodology of fermentation, or breeding of plants, etc. This useful information is generally not systemized, even in some cases not written and therefore difficult to get and to spread.

Patent offices are routinely facilitating access to technology contained in patent documents as part of their obligations: to grant patents but also to disclose them.

Classifications related with technology dealing with Biological Diversity Conservation are, in general, in the chemical section C and in particular in class 12 (Biochemistry, Biotechnology, Enzymology, Fermentation,

Microbiology, Genetic Engineering, etc.), but other classes may also contain groups and subgroups dealing with this matter.

About the transfer of patented technology, patent offices may play a secondary but also important role. As I have previously said, mutually agreed licenses are the instruments more commonly used to transfer patented technology. In some legislations lack of exploitation of patents may lead to the expiration of the patent. This exploitation requirement may be replaced by the public offering (published in a newspaper) of licenses when the holder of the patent can not put it in exploitation himself. Patent offices should send monthly lists of licenses offered related to biodiversity conservation, to developing countries, to facilitate contract between partners for transfer of technology on mutually agreed terms. Spanish patent office also collaborate with some other organisms of the Spanish Industry Ministry to evaluate partnership industrial projects between Spanish and foreign firms, in which, in some cases, transfer of technology is involved.

C. Exchange of Information

Article 17 of the convention deals with this important aspect. This article is complementary in many ways to the previous one. In effect, in many cases and especially when developing countries are involved, to guarantee a free access to technology is not enough. How to know which technology is relevant to or developed from the genetic resource provided? The cooperation shall go one step further and to assure a fluid flow of information from developed to developing countries, in matters related to the conservation of biological diversity.

First problem that immediately arises is, what information can be subject of being exchanged? Article 17 itself answers that question: publicly available information. Know-how, trade and industrial secrets, secret patents, get published patent applications, etc. are not included in the concept of publicly available.

If cooperation in the field of exchanging information has to go one step further only to assure access to technology, the role of patent offices in this field has also to be more active than their mere normal functions. Spanish patent office has an entire department of Technological Information with a Diffusion section dedicated only to distribute patent, utility models, trade marks, etc., information among users of our services. These services include, among others:

- selective diffusion by IPC sectors or by applicants.
- publication of bulletins with bibliographic data and abstracts.
- annual indexes, statistics and monographs.
- retrospective searches in national and international data bases or CD-ROM's (assisted or done on-line by the user himself).

- search reports,
- technological surveillance (Biotechnology and Environmental Technology, for example).
- technical assistance.

As you may see Spanish patent office, in line with most of the existing Industrial Property Authorities, has gone not one but several steps ahead in patent information diffusion. Most of these services are charged to the users, but with a policy of public prices with reduced fares. Our office has been cooperating with South American countries in the field of exchanging patent information without cost since 1982. Seventeen South American countries may order patent copies and search reports on any industrial sector and receive patent documentation, free of charge thanks to bilateral cooperation treaties signed between the respective patent offices. Nearly 982.000 microfiches of Spanish patents and utility models, more than 14.000 bulletins, 216 retrospective searches, 285 Spanish patent documents' copies, have been sent by our country. In compensation we receive patent documents of those countries (nearly 25000 since 1982, plus almost 600 bulletins and more than 2600 first pages) which we keep as part of our funds and loaded onto our data base CIBEPAT (more than 132.000 references corresponding to South American patents, have already been loaded, of a total amount over 600.00 references contained), available in CD-ROM support and that we also supply to those countries. Together with EPO and WIPO we also published in CD-ROM first pages of South American patents (DOPALEs) and fully documents of Spanish patents since 1990 and we have created a network of CD-ROM units to access to the patent information published in that support. Other cooperation activities with South American countries include microfilming of national patent documents (nearly 85.000), patents seminars (together with WIPO and EPO), training programmes (every year a number of grants are offered to South American Countries to attend activities to the exchange of patent information have crystallized in the constitution of an International center of Documentation in Spanish and Portuguese languages that has not started fully functioning yet.

I hope these experiences may serve as samples of the role to be played by patent offices of developed countries in the cooperation with developing countries on exchange of information about the conservation of biodiversity.

D Technical and Scientific Cooperation

Technical matters are covered by article 18 of the Convention. Most of them are linked to previous articles about exchange of information and access to and transfer of technology. In fact they all are, together with article 19 dealing with sharing of benefits, the bases of the whole cooperation scheme outlined in the Convention. These four articles constitute the compensations to bal-

ance the technology system towards the direction of countries providing genetic resources, generally developing countries. They are clearly designed to contribute to lighten the burden of biodiversity conservation, that mainly falls over developing countries.

It is generally accepted that patents are better technical instruments than scientific ones. For scientific purposes, journals and books are more useful tools than patents. However, scientific literature is also used and joined to search files routinely classified by each examiner. Obviously there are more suitable documentation centers than patent offices, to organize, administrate and cooperate on scientific information, but we, just in case, may also contribute with our grain of sand in this respect. The article, in any case, talks about technical and scientific cooperation in more general form than the strict cooperation in scientific information. From this point of view, technical and scientific cooperation in general terms would escape the scope of patent offices to be converted as a matter of general policy, and what the article intends, is the creation of a framework to encourage cooperation in the technical and scientific fields. To successfully achieve this goal, the private sector shall be involved in such cooperation, attracted by policy measures (generally economic and fiscal).

The paper of IPR's in this cooperation process has been previously discussed. Perhaps only to add something about the paper of know-how in the process of technical cooperation. Know-how could be considered as part of non written IPR's. Effectively, as I have previously said, IPR's are commitments between the inventors and the society. In exchange of being granted by the society with an exploitation monopoly, inventors disclose their inventions adding them to the called "state of the art". What then is the know-how? Well, the disclosure of the invention must allow to any person skilled in the art, to execute the invention, to put it into practice. But nothing is said about disclosing optimal parameters, more profitable embodiments, highest rentability ways of action, etc. This hidden knowledge, saved secretly voluntarily and legally by the holder of the patent constitute the know-how. Most of the technology transfer contracts include both items, IPR's to be transferred and know-how. When we talk about technical cooperation and we think in human resources development, through training programmes, for instead, we must be aware that know-how usually covers the personnel formation, to operate the invention in the most effective way.

E. Distribution of Benefits

Article 19 covers in paragraphs 1 and 2 this mechanism of compensation, in this particular case, derived from Biotechnology. I must admit that I do not see yet, after many discussion sessions on this matter, the necessity of doing a specific mention of Biotechnology. It is true that technologies involving living matter and covered by the term Biotechnology, have suffered an

our development since DNA recombination techniques were discovered by Boyer and Cohen 1974. It is also true that natural genetic resources are commonly used by biotechnology industry and that huge amounts of money have been invested in this sector during the last 10 years. Only if we consider biotechnology as a course of biodiversity, has any justification to do some specific mention to this technology in the text of the convention. However I really do not agree to drafting a separate article that deals with biotechnology and mixing up the concepts of safe handling and sharing of benefits.

From the point of view of IPR's there is nothing to say about safety regulation for the use of biotechnology. The concept of safety has no meaning in patent laws. Another rather different thing is the concept of sharing of benefits. A patent give to its holder a monopoly of exploitation, how to make compatible this monopoly with a distribution of benefits? First of all article 19 only talks about access to the results and benefits arising from biotechnologies based upon genetic resources provided by developing countries. The access to the benefits must be, obviously, also on mutually agreed terms. In my opinion this last sentence, present in most of the articles of the Convention, is the key word to work out any cooperation between countries providing genetic resources and those providing technology. Taking the example again of the DNA recombination technique discovered by Boyer and Cohen, Stanford University, where Stanley Cohen worked at the time of this discovery, patented the DNA recombination technique and free of charge, to any scientific public researcher to use them. For private researchers the university charged companies with a 0.5-1 % royalty of total commercial sales. This more than reasonable, royalty gives Stanford University more than 1 million dollars per year as income of more than 70 licenses granted from the patent. Here is shown an example of sharing benefits derived from biotechnology. Countries providing genetic resources could specify in the mutually agreed contract of access to such a material, a percentage of sales to be returned. But the distribution of benefits not only has to imply money sharing. It may be also important to have assured a certain return in the form of staff training, establishment of institutions in developing countries, priority access to the new material developed, etc. Biotechnology inventions are considered by the interested circles, as not sufficiently covered by the present patent system. EC commission has drafted a text of directive addressed to achieve an effective protection of these inventions, adapting and harmonizing existing patent laws, but respecting international conventions on Industrial Property, as European Patent Convention (EPC) and CUPOV. The directive wants to offer an effective answer to the demands of the European industries working in this sector, in order to allow them to compete in more equitable conditions with American and Japanese companies which have in their own countries legal

patent systems more permissive when patentability of living matter is involved. This new directive has four main purposes.

- do not exclude any invention of patentability for the only reason that is composed of living matter, as general principle.
- to consider biological classifications other than plant or animal varieties or races, patentable subject matter.
- to extend the scope of patent protection over genetic material to following generations obtained by multiplication and propagation, and to any host that contains said genetic material.
- to limit access to deposited living matter when patent applications have been refused, withdrawn or, through an expert, until technical preparations for publication of the application are deemed to have been completed.

With these legal instruments EC commission expects to create an effective protection structure for biotechnological inventions that will offer a larger certainty for the investments of the companies working in this field. All these future measures have direct impacts on the implementation of the Biodiversity Convention. But, from the point of view of article 19, they assure money returns for companies doing investments in biotechnology research. When benefits are generated, to share them with countries providing genetic resources used in said research, is more feasible. Chapters 15 and 16 of Agenda 21 are also aware of the importance of biotechnology in a Convention of these characteristics, and the crucial role of sharing of benefits arising with communities whose indigenous or traditional lifestyles, are a continuous source of biodiversity, that also means a continuous source of development capability for industry in developed countries. Benefits arising from biotechnology will assist developing countries providing genetics resources to preserve traditional methods and knowledge of indigenous people which have a relevant role to the conservation of biological diversity.

It appears quite clear to all of us that the implementation of the Biodiversity Convention greatly depends on additional financial funds to be provided by developed countries. The decision of who will be the organism in charge of the administration of such funds, exceeds my position as technical adviser of a national office. The incremental costs accrued by developing countries in the implementation of the provisions of the Convention need to be covered by these new and additional financial resources (Costs and benefits for the developing countries of becoming parties to environmental treaties, Mostafa K. Tolba UNEP). Only a few states at the Rio Earth Summit made financial commitments to increase their percentage of Gross National Product (GNP) dedicated to global conservation efforts and Spanish President Gonzalez was one of them.

The EC, at this specific point on the financial mechanisms to be implemented to work out the cooperation projects related to conservation matters, is always aware of the transnational dimension of the problem which exceed the community borders. In this sense EC has been an active participant in various conventions related to conservation aspects such as CITES (commerce international or threatened extinction species) or Lome IV which aims are the safeguard of ecosystems in danger such as forests, for example. EC states members have also signed the Biodiversity Convention conscious that conservation of biological resources implies financial funds to aid the poorest countries to preserve ecosystems and native species. These financial and long term investments are important, not only for those local regions where biological diversity is located, but also for the future of the entire humanity (Report of the EC Commission to the UNEP Conference at Rio de Janeiro, June 1992 DOC.SEC(91) 2448 final).

I hope my paper clarifies some doubts participants may ever have about the role IPR's may play in the implementation of the Biodiversity certify that Convention. I will also satisfy if I have been able to show to all of you, how patent offices may help to put the Convention into practice, facilitating access to and transfer of technology and enhancing the exchange of information. I also expect my explanations about specific protection for each living matter related invention, reflects the complexity level we have to face when we transfer the Convention to national laws in such a specific field.

IPR's have to be an additional instrument of cooperation between developed and developing countries and never be an obstacle to achieve the final aim of the Convention: Conservation of Biological Diversity as common heritage of mankind.

International Conference on the CONVENTION ON BIOLOGICAL DIVERSITY

National Interests and
Global Imperatives

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CSB
FYI. This is pretty good paper.
I took it. Horsey has not
spoken to you about this
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a friend that works in a R&D
member company.

1/19/93
January 6, 1993

Implications of the Intellectual Property-Related Provisions of the U.N. Convention on
Biological Diversity for the U.S. Pharmaceutical Industry

by
Jacques J. Gorlin, Ph.D.

A. Introduction

While 153 countries and the EC signed the Convention on Biological Diversity at the U.N. Conference on Environment and Development (UNCED) in Rio de Janeiro in June, 1992, only five countries -- the most recent being Canada -- have ratified the convention. Ratification by thirty countries is required before the convention enters into force.

The intellectual property-related provisions of the convention would sanction governmental interference in contractual relationships by interposing governments into an investment and technology transfer process that should essentially be among private parties. In analyzing the provisions, one must look both at the rights that the developing countries (LDCs) will gain from the biodiversity convention vis-a-vis their foreign private sector partners and also at the obligations that will fall on the shoulders of the developed country parties to the convention. These obligations could require developed country parties to undertake certain intellectual property-restricting actions and could limit their ability to support their private sectors in any negotiations with the LDC sources of genetic material.

There are numerous provisions of the convention that raise issues of concern for the pharmaceutical industry. This memorandum, however, will specifically focus on the key intellectual property-related provisions of concern to the U.S. pharmaceutical industry and will analyze the implications and consequences of these provisions for the industry. The paper will also suggest a strategy that the industry could pursue in anticipation of a possible decision by the Clinton Administration to support U.S. signature and ratification of the convention.

B. Key Intellectual Property-Related Provisions of the Convention

Articles 15, 16, 17, 19 and 22 are the principal intellectual property-related provisions of the biodiversity convention. The final text that was on the table in Rio represents an improvement over the pre-Nairobi penultimate text. U.S. negotiators were able to gain these improvements by using such lawyer's techniques as adding "where feasible" or "mutually acceptable" to many of the provisions that mandated a governmental interposition in the technology transfer process. Nevertheless, the convention established certain principles that could be used to permit the suppression and violation of intellectual property rights. Articles 15, 16, 17 and 19 of the convention describe a process that defines the terms for:

- Access to genetic resources (Article 15);
- Access to and transfer of technology (Article 16);

- Exchange of Information (Article 17); and
- Handling and sharing of benefits (Article 19).

Article 22, which defines the relationship of the biodiversity convention to other international conventions, could be construed as calling into question the obligations of parties to protect intellectual property under WIPO treaties or an eventual GATT TRIPS agreement.

Article 15.2 (Access to Genetic Resources) calls on each party "not to impose restrictions counter to the objectives of this convention." Among the convention's objectives (Article 1) is not only the "conservation of biological diversity" but also "the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by...appropriate transfer of relevant technologies." Laws and regulations protecting intellectual property could be viewed as imposing restrictions on the "fair and equitable sharing of the benefits arising out of the utilization of genetic resources" and thus be in violation of the convention.

Article 16 (Access to and Transfer of Technology): Article 16.2 stipulates that access to and transfer of technology "shall be provided and/or facilitated under fair and most favorable terms, including on concessional and preferential terms where mutually agreed upon..." While the terms of LDC access must be "mutually agreed upon" by the parties, they must also be "fair and most favorable" for the developing country.

In an apparent victory for U.S. negotiators, Article 16.2, however, continues: "In the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights." India turned the U.S. success into a pyrrhic victory by requiring that the application of paragraph 2 -- and hence, the respect for the adequacy and effectiveness of intellectual property rights -- be consistent with paragraphs 3,4 and 5 of the Article.

Article 16.3 would require developed country parties to ensure that the LDCs that provide the genetic resources are provided access to and transfer of technology which make use of those resources, "including technology protected by patents and other intellectual property rights." "Ensuring access to technology" for all intents and purposes is a euphemism for a "compulsory license."

Article 16.4 would require developed country parties to ensure that their industries facilitate access to "joint development and transfer of technology...for the benefit of both the government and the private sector of developing countries." Once the technology was developed, the foreign private sector partner could be forced to grant back licenses to a potential governmental or private sector competitor in the LDC.

Article 16.5 encapsulates the convention's attitude towards intellectual property protection. It calls on the parties to the convention to ensure that intellectual property rights "are supportive of and do not run counter" to the convention's objectives, i.e., that such rights do not restrict the transfer of technology. The convention's presumption is that, since intellectual property rights conflict with technology transfer, the parties to the convention must be vigilant to ensure that intellectual property rights support the convention's objectives.

Article 17 (Exchange of Information): Article 17.1 of the convention limits the exchange of information to information that is publicly available. The limitation, however, is modified by the requirement that the "special needs of developing countries" have to be taken into account. Conceivably, the "special LDC needs" could be used to require the disclosure of confidential information owned by the foreign private sector partner that is normally protected under trade secrets.

Article 17.2, which enumerates the types of information exchanges envisioned under Article 17.1, includes "repatriation of information." Once again, this would appear to permit the expropriation by governments of proprietary information through "repatriation" into the public domain.

Article 19 (Handling of Biotechnology and Distribution of its Benefits): Article 19.1 interposes governments in the process by requiring "effective" LDC participation in the biotechnological research activities and that, where feasible, the research take place in the LDC.

Article 19.2 would permit contracting parties to take measures that would "promote and advance access on a fair and equitable basis" by developing country parties "to the results and benefits arising from biotechnologies...." This paragraph raises a number of concerns:

- (a) It would appear that either the developed country or LDC government could require that the private sector partner license the technology ("access to the benefits and results") to the developing country party on a "priority basis."
- (b) The "fair and equitable basis" for the priority access, as commonly understood, leaves the terms of the remuneration to the government's unilateral determination. In contrast, Article 31(h) of the GATT Dunkel TRIPS text states that, in the case of compulsory licenses, "the right holder shall be paid adequate remuneration in the circumstances of each case, taking into account the economic value of the authorization." The phrase "fair and equitable" was considered and rejected during the course of the GATT TRIPS negotiations.
- (c) The additional requirement that the access be on "mutually agreed terms" would not prevent a LDC partner from demanding "access to the benefits" under a "fair and equitable " but onerous basis after the foreign private sector partner had invested heavily into the research and development of the genetic resource. The skewed negotiation that would follow would force the private sector partner to choose between foregoing his sunk investment and mutually agreeing to a "fair and equitable" offer made by the LDC party.

Article 22 (Relationship with Other International Conventions): Under Article 22.1, parties to the biodiversity convention would not be bound by any of the WIPO intellectual property agreements or by a possible GATT TRIPS accord if the "exercise of those rights and obligations would cause a serious damage or threat to biological diversity."

C. Implications and Consequences of the Intellectual Property-Related Provisions for the Industry

Two sets of implications flow from the intellectual property-related provisions of the biodiversity convention: the first set flows from the intellectual property-related provisions themselves while the second set would flow from a U.S. decision to sign and join the convention.

(1) Implications of the Intellectual Property-Related Provisions Themselves

(a) The inclusion of provisions that call into question intellectual property protection in a multilateral convention ostensibly aimed at conserving biological diversity indicates that the United States has not yet turned the corner in neutralizing the LDC approach to economic development. The LDC approach views intellectual property as another tool -- rather than a private property right that must be protected -- that LDC governments can use to attain their economic development objectives. The technology transfer provisions are a throwback to the days of the North-South Dialogue and the endless UNCTAD sessions of the 1970s. The convention, as was the North-South Dialogue of the 1970s, is based on the false premise that economic development and technology transfer can be promoted by sweeping governmental declarations taken in a U.N. body that mandate investment terms rather than on the ground, through the establishment in individual countries of the proper environment for foreign investment. Such an environment includes adequate and effective intellectual property protection.

(b) The inclusion of the intellectual property-related provisions -- especially Article 16.5 -- can be construed to confirm the LDC contention that there is a basic conflict between strong intellectual property protection and protection of biodiversity.

(c) The intellectual property-related provisions will make it more difficult for the industry to negotiate agreements with LDCs that follow the pattern of the Merck-INBio accord. Among the critical elements of the INBio agreement were the proper protection of intellectual property rights and the establishment of appropriate compensation mechanisms, both of which are called into question by the convention's provisions.

(d) Given the convention's support for preferential sharing of technology, LDC governments may wait for the convention's entry into force before entering into further discussions on INBio-type arrangements or may begin to insist upon terms supported by the convention prior to the convention's entry into force.

(e) Given the obligations that fall on the developed countries to assist in the technology transfer process, the industry may not be able to rely on the support of developed country governments in their negotiations with LDC governments and institutions.

(f) The convention's weak intellectual property provisions will give the opponents of strong multilateral intellectual property protection -- led by India -- ammunition to counter the arguments of the U.S. and other developed countries in GATT and WIPO. It is not surprising that India led the charge to weaken the intellectual property provisions in both the biodiversity convention and the GATT TRIPS negotiations.

(g) On the other hand, the intellectual property provisions of the convention could prove to be counterproductive to the LDC search for increased technology transfer. Potential foreign private partners will not enter into arrangements for the use of foreign-source biological material in product development unless these arrangements contain satisfactory provisions for intellectual property protection and appropriate compensation mechanisms. The economic development of the LDCs could very well be retarded by the convention due to the reluctance of potential private sector partners to invest under unfavorable conditions.

(2) Implications of a U.S. Decision to Sign the Convention

(a) A U.S. decision to sign and join the convention will make more difficult successful outcomes in the GATT TRIPS negotiations and future bilateral special 301 negotiations. For example, U.S. support for the convention's special intellectual property provisions in favor of the LDCs would pull the rug from under the arguments of U.S. negotiators for strong pipeline protection, which specifically asks LDCs to undertake special provisions in favor of pharmaceutical inventions of right holders principally from developed countries.

(b) U.S. support of the biodiversity convention will be viewed as a signal of a diminished U.S. commitment to strong intellectual property protection and may embolden India and its fellow travellers to try to move intellectual property protection and technology transfer issues out of the GATT and into more politicized U.N. bodies. Such a U.S. move could reverse past U.S. successes in neutralizing the North-South dialogue and in using bilateral investment treaties and intellectual property agreements with individual countries to develop the favorable conditions and incentives for the technology transfer that LDC economic development requires.

D. Strategy to Deal with a Possible U.S. Signing of the Convention¹

In anticipation of a possible change in U.S. policy on the convention, it would be prudent if the industry were to adopt a strategy along the following lines:

1) Domestically, the industry should begin an education campaign for the new Administration and Congress explaining that, while the industry supports the protection of biodiversity, it has major concerns about the convention's specific intellectual property-related provisions. The industry should indicate that its support for the convention is contingent on improvements in the intellectual property-related provisions. In this regard, the industry should use Vice President-elect Gore's view that "access to native resources and protection of intellectual property are complementary concerns" as the intellectual starting point for the campaign.

¹ The strategy suggests steps to deal with the intellectual property-related of the industry. It does not take into account the effect on the strategy of other aspects of the convention (financing mechanisms, voting structure, regulation of biotechnology, etc.) that also may be of concern to the industry.

2) To facilitate the education program, the industry should draft a suggested protocol to the convention that would contain the revisions that the industry seeks in the intellectual property-related provisions.

3) In anticipation of U.S. adherence to the convention, the industry should also begin drafting an interpretation document that would explain the U.S. position on the intellectual property-related provisions. (Article 37 of the convention does not permit reservations). While these interpretative notes are not legally binding, they would put the other parties to the convention on notice on how the U.S. plans to interpret the convention. The draft interpretative notes should make clear the supremacy of adequate and effective intellectual property protection in the technology transfer process and that the U.S. Government expects other governments to interpret the provisions in a similar manner.

4) In the interim, pharmaceutical companies should consider creating "facts on the ground" by pushing ahead with negotiations in individual LDCs on additional Merck-INBio type arrangements that will contain effective intellectual property protection and appropriate compensation measures.

5) The industry should develop an international consensus with counterpart pharmaceutical associations in Europe and Japan in opposition to the currently-drafted intellectual property-related provisions of the convention. Counterpart associations would be urged to lobby their governments to support the negotiation of a protocol prior to their ratification of the convention. Should the United States sign the convention with interpretative notes and not pursue the negotiation of a protocol, the foreign counterpart associations would also be urged to get their governments to adopt similar interpretations of the convention.

6) The industry should follow very closely both the deliberations of the UNEP Experts Group that is looking at the technology transfer issues raised by the convention and also the preparations for the UNEP Governing Council meeting in May. The Council is expected to agree to the formation of an intergovernmental committee that will begin preparations for the implementation of the convention. Both signatories and "interested parties" will participate. Close scrutiny and involvement by the industry in development of the U.S. position will help ensure that changes in U.S. intellectual property policy will not inadvertently be signaled by U.S. officials.

7) If the U.S. decides to go ahead and sign the convention, the industry should seek to gain the Administration's support for the negotiation of a protocol that would be agreed before the convention enters into force. The industry should seek Congressional support for the protocol approach.

E. Conclusion

While the intellectual property-related provisions of the convention, in and of themselves, raise serious concerns for the industry, the overriding question is whether the Clinton Administration will change U.S. policy and sign the convention as currently-drafted. Such a decision would set off shockwaves in the intellectual property community both here and abroad, which would view the move as raising doubts about the Clinton Administration's commitment to

strong worldwide intellectual property protection. It thus is critical that the industry quickly implement a strategy that will explain the intellectual property-related implications of U.S. adherence to the currently-drafted convention and suggest possible solutions for correcting the intellectual property-related provisions.