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**A "New Breed" of Treaty:
The United Nations Convention
on Biological Diversity**

BY PROFESSOR CATHERINE TINKER*

The United Nations Convention on Biological Diversity¹ (Treaty or Convention) entered into force on December 29, 1993. One of the unique things about this Convention is the speed with which it was negotiated, which was a record due to the desire to produce a document for signing at the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil.² When the Treaty was opened for signature at the Earth Summit in Rio de Janeiro, Brazil, on June 5, 1992, it was signed by a record number, 157 States. By early October 1993, approximately forty nations had ratified

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1. *Convention on Biological Diversity* of the United Nations Conference on the Environment and Development, *opened for signature* June 5, 1992, U.N. Doc. DPI/1307, *reprinted in* 31 I.L.M. 818 [hereinafter *Biological Diversity*].

2. Only five negotiating sessions were held in 1991 and 1992. There were major problems and areas of disagreement literally up until the last night in Nairobi in the final negotiating session; Dr. Tolba, the Executive Director of United Nations Environment Programme, took a direct hands-on approach to finally concluding the treaty negotiating in late May, which resulted in the document that was sent on to Rio at the beginning of June, 1992, a very tight time frame. The Law of the Sea treaty, by comparison, took over two decades, with formal negotiating sessions lasting nine years. Edith Brown Weiss, *International Environmental Law: Contemporary Issues and the Emergence of a New World Order*, 81 GEO. L. J. 675, 685 (1993).

the Convention, permitting the treaty to enter into force at the end of 1993.³ The first Conference of the Parties (COP) was held from November 28 to December 9, 1994 in Nassau, Bahamas.⁴ The seventy-five nations who ratified the Convention attended the meeting; in attendance were also other states attending as observers without the ability to vote and a number of non-governmental organizations.

The new legal obligations created by the Convention on Biological Diversity involve both principles of international law and a commitment to adopt national legislation. Ambiguity remains in the final text of the Convention, and some areas are still open to interpretation through the Conference of the Parties or national legislation. In a joint introduction to a volume published by the International Union for the Conservation of Nature (IUCN) and the International Academy of the Environment in Geneva, the Convention on Biological Diversity is called:

. . . simply an enabling document and treaty. It sets out what governments have agreed on regarding mutual support to national efforts to conserve the wealth of the planet, and collaboration to enable biological resources to be developed and used to the maximum possible benefit of people.⁵

Dr. Andronico Adede has noted the appearance in international law of a "new breed" of treaties to integrate issues of environment and development;⁶ the Biodiversity Treaty is a perfect example. These new treaties balance the needs and concerns of developing countries against the goals of industri-

3. By the treaty's own terms, the treaty would enter into force "on the ninetieth day after the date of deposit of the thirtieth instrument of ratification, acceptance, approval or accession." *Biological Diversity*, *supra* note 1, art. 36(1). A total of 106 states have ratified or acceded to the treaty as of December 6, 1994.

4. The second Conference of the Parties met in Bali in November, 1995.

5. MARTIN HOLDGATE & BERNARD GIOVANNINI, *Biodiversity Conservation: Foundations for the 21st Century*, in WIDENING PERSPECTIVES ON BIODIVERSITY 3, 4 (Anatole F. Krattiger, et al. eds., 1994).

6. Andronico Adede, *International Environmental Law: The Treaty System from Stockholm (1972) to Rio (1992)*, PACE ENVTL. L. REV. (forthcoming, fall 1995).

alized countries and find a balance or compromise. The progress that has been made in just twenty years in international environmental law-making has resulted in the treaty negotiation process becoming a more level playing field for Third World delegates. There has also been an expansion in the process that brings in non-governmental organizations and recognizes the role of local communities, indigenous people and other major groups, especially women, who are absolutely essential to the implementation of any of these sustainable development treaties.

A real shift is visible in treaty-making between the time of the Stockholm Conference and the Rio Conference. For example, unlike any earlier multilateral sustainable development treaty, the preambular language to the United Nations Convention on Biological Diversity recognizes the vital role that women play in the conservation and sustainable use of biological diversity and affirms the need for the full participation of women at all levels of policy-making and implementation for biological diversity conservation. It is the only multilateral treaty that acknowledges a fundamental link between women's participation and the implementation of the treaty itself. The philosophical, legal and theoretical resonances of the term "diversity" obviously imply a respect for the variety of life, a recognition of a non-hierarchical system in which all of the parts are honored, and where mere size, economic value, gender, race, class, or nationality are not the determining factors of entitlement. It is an ecosystem approach⁷ to international law-making.

In the case of biological diversity, the Convention recognizes the value of all the components of biodiversity in the way they work together to create an ecosystem and accepts as

7. An ecosystem approach to conservation supersedes concerns for only a single species or habitat. Earlier wildlife protection treaties such as the migratory bird treaties have now been complemented by treaties like the *Biological Diversity* based on principles of conservation biology. CONSERVATION BIOLOGY: AN EVOLUTIONARY-ECOLOGICAL PERSPECTIVE (Michael E. Soule & Brice A. Wilcox eds., 1980); CONSERVATION BIOLOGY: THE THEORY AND PRACTICE OF NATURE CONSERVATION, PRESERVATION, AND MANAGEMENT (Peggy L. Fiedler & Subodh K. Jain eds., 1992); and Richard Primack, *ESSENTIALS OF CONSERVATION BIOLOGY* (1993).

a goal that all the components must be conserved and sustainably used. The Treaty, moreover, considers what this might mean and how the conservation and sustainable use of biological diversity might be achieved. More importantly, the Treaty recognizes a third objective, which is the equitable sharing of the benefits of biodiversity, achieved by the transfer of technology and by financing.⁸

The World Conservation Union because of its preparation of the first draft of this Treaty should be credited with the Treaty's initiation. IUCN used principles of conservation biology as the underpinnings of this new international law. A very recent development in international law-making involves using scientific knowledge from biologists and other scientists before bringing in the lawyers to prepare a draft. Then, at the Intergovernmental Negotiating Committee sessions, the diplomats take over, very few of whom are international lawyers. These diplomats include a very small informal legal subcommittee of government delegates that met during the Biodiversity Treaty's final negotiating session and were constrained by official instructions from their governments. That may explain a few of the ambiguities in the text of the treaty, and suggest ways to clarify the meaning of some turgid language that crept into the final text.

Overall, the Convention on Biological Diversity is a far-reaching and ambitious instrument of international law, which will be of increasing importance in the next century if the political will exists to implement its provisions. This Treaty balances the self-interest of one group of nations who have something they value and can offer to others, namely a rich supply of genetic resources, and the self-interest of another group of nations who have their own resource that they, in turn, can offer to the first group, such as technology and financing. Each group has an interest in acquiring what the other has. In the language of this Treaty, the trade-off is between access to genetic resources, on the one hand, and access to the transfer of technology and the benefits of equitable sharing of the resources, on the other hand. The Convention

8. *Biological Diversity*, *supra* note 1, art. 1.

on Biological Diversity represents the first time this kind of balance has been codified in binding treaty law and is a significant departure from the old model of top-down treaty-making where economically weaker parties were expected to sign on the dotted line when presented with a final text. The Biodiversity Treaty marks a stage of significant growth of international environmental law in the codification of Principle 21 of the Stockholm Declaration,⁹ which recognizes national sovereignty over natural resources *and* the responsibility not to harm the territory of other States or areas beyond national jurisdiction.¹⁰ The Biodiversity Treaty copies Stockholm Principle 21 verbatim in the text of the treaty and, therefore, becomes binding on all parties, rather than being mere "soft law" or non-binding declaratory language.¹¹

I. Definitions and Scientific Principles

The Convention defines biodiversity as:

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.¹²

This concept evolved from the need to expand the protection offered by a series of regional¹³ and multilateral¹⁴ treaties designed to protect species such as migratory birds and eco-

9. The Stockholm Declaration of the United Nations Conference on the Human Environment was adopted by the U.N. Conference on the Human Environment at Stockholm on June 16, 1972. *Stockholm Declaration on the Human Environment*, at 2-65, U.N. Doc. A/CONF.48/14/Rev. 1 (June 16, 1972), reprinted in 11 I.L.M. 1417 (1972) [hereinafter *Stockholm Declaration*].

10. *Id.* Princ. 21.

11. Compare *Biological Diversity*, *supra* note 1, art. 3 with Stockholm Declaration, *supra* note 9, Princ. 21.

12. *Biological Diversity*, *supra* note 1, art. 2.

13. *E.g.*, the African Convention on the Conservation of Nature and Natural Resources, the ASEAN Agreement on the Conservation of Nature and Natural Resources, the Berne Convention on the Conservation of European Wildlife and Natural Habitats, and the Western Hemisphere Convention. See MULTILATERAL TREATIES IN THE FIELD OF THE ENVIRONMENT (Rummel-Bulska & Osate eds., 1991).

systems such as wetlands.¹⁵ By setting aside protected areas or attempting to regulate trade in endangered species, only piecemeal conservation was achieved, which was often too little too late.

The Convention on Biological Diversity is grounded in a broad ecosystem approach to conservation and sustainable use of biological diversity. As the World Charter for Nature¹⁶ recognized in 1982, "life depends on the uninterrupted functioning of natural systems which ensure the supply of energy and nutrients."¹⁷ Preserving species alone is not enough to protect biological diversity. Biologists and ecologists have discovered the importance of ecosystems, as corridors linking necessary habitats to support numbers of birds, animals, and plants of different species, and as rich depositories of bacteria, microorganisms, and species not yet identified by humans with unimaginable value.

Understanding the interrelationships and dependencies of these varied forms of life within ecosystems helps explain why preserving species alone is not enough to achieve the goal of conservation and sustainable use of biological diversity. Indeed, a species-focused effort divorced from the ecosystem may be doomed to failure once habitat is reduced or variety between and within species and ecosystems is lost. Some current thinking suggests that a "species-orientation" for law is scientifically suspect, due to the controversy over what actually constitutes a species as well as disputes, over

14. Convention on International Trade in Endangered Species of Wild Fauna and Flora, Mar. 3, 1973, 27 U.S.T. 1087, T.I.A.S. No. 8249, 993 U.N.T.S. 243, *reprinted in* 12 I.L.M. 1085 (1973) [*hereinafter* CITES]. For more about CITES see John L. Garrison, *The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Debate Over Sustainable Use*, 12 PACE ENVTL. L. REV. 301 (1994).

15. Convention on Wetlands of International Importance Especially Waterfowl Habitat, done Feb. 2, 1972, 996 U.N.T.S. 245 (1976), *reprinted in* 11 I.L.M. 969 (1972) (entered into force Dec. 21, 1975) (done in Ramsar, Iran). See Staunton L.T. Golding, *Beyond the Ramsar Convention a Proposal for the International Protection of Wetlands Through Binding Regional Agreements*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 359 (1992).

16. *World Charter for Nature*, G.A. Res. 37/7, U.N. GAOR, 37th Sess., Supp. No. 51, U.N. Doc. A/37/51 (1982), *reprinted in* 22 I.L.M. 455 (1982).

17. *Id.*

how useful the distinctions may be, especially in light of the overwhelming number of species which have not yet been catalogued, identified, or studied in virtually every ecosystem around the globe.

Nature itself is not static. Whether in response to human activity or untouched by human hands, natural ecosystems are resilient. Biologists and others have given us the tools to recognize that much of this adaptability is due to the diversity of life itself. Nature selects the species possessing certain traits which allow survival under certain conditions. When drought, overpopulation, temperature or disease alter those conditions, animal and plant species must possess both species diversity and population diversity to adapt, or they will expire. Diversity is the best guarantee of survival of life on this planet. The danger in destroying biological diversity is that the pool of genes in reserve — the recessive genes, genes for traits not currently in demand, or genes found in wild flora or fauna — will be diminished. Then in some future crisis, nature may not be able to regenerate or respond to changing conditions and some life forms, maybe even human life, will become extinct. Commenting on marine biodiversity, over forty years ago Rachel Carson described an area of creative ferment and fertility in the oceans:

As between tropical and polar regions, the differences in the kinds and abundance of life are tremendous . . .

Sea life in the tropics, then, is intense, vivid, and infinitely varied. In the cold seas it proceeds at a pace slowed by the icy water in which it exists, but the mineral richness of these waters largely a result of seasonal overturn and consequent mixing makes possible the enormous abundance of the forms that inhabit them . . .

And wherever two currents meet, especially if they differ sharply in temperature or salinity, there are zones of great turbulence and unrest, with water sinking or rising up from the depths and with shifting eddies and foam lines at the surface. At such places the richness and abundance of marine life reveals itself most strikingly.¹⁸

18. RACHEL CARSON, *THE SEA AROUND US* 22-23 (1951).

The rich biological diversity found in tropical forests, oceans, coral reefs, and wetlands is a veritable warehouse of genetic variability. Genetic material enables species to adapt to changing climate and moisture conditions or to resist disease and pests. The economic value of biodiversity as a natural resource is now beginning to be recognized and may someday be measured to exceed the economic value of development, which produces short-term income at the cost of destroying biodiversity. Nonetheless, the Convention's requirement for environmental impact assessments to consider the effect of a proposed development project on biodiversity is a procedure which is designed to illuminate the value of biodiversity for policy-makers and to involve the local community. Economists have not identified the tools by which this valuation can be done consistently and accurately, stymied in part by the scientific uncertainty about what genes, species, and habitats exist within a given ecosystem, or what effect the absence of any one organism may have on the health and viability of the entire ecosystem. To this end, the Convention mandates both an extensive cataloguing effort within each Contracting Party's territory and a program of data collection, research, and training.¹⁹

Sustainable development need not and should not be an attempt to freeze everything the way it is right now, preserve it in amber, or create a museum. In nature, life forms evolve, adapt, change, and die. Intervention, by human activity precipitously alters the environment. The better approach is to use resources carefully, and only where the effects of such use can be predicted and controlled. If the effects of human activity on ecosystems, genes, and species cannot be known for sure, the precautionary principle²⁰ can serve as the parameter to conserve these components of biological diversity, until the state of human knowledge develops to safely proceed with their use. Sustainable development is, thus, a very

19. *Biological Diversity*, *supra* note 1, art. 12.

20. See, e.g., DAVID FREESTONE, *The Precautionary Principle*, in INTERNATIONAL LAW AND GLOBAL CLIMATE CHANGE 21 (Robin Churchill & David Freestone eds., 1991).

dynamic concept, the whole point of which is to preserve the adaptability of life on the planet.

The idea of keeping seed banks, for example, is to have something in reserve for the future. Monocultures are not very sustainable. Most of the commercial hybrid seed corn of the United States is grown in the Midwest, for example, based on one strain of corn. When a disease or a pest threatens that strain of corn, there is serious trouble for farmers and people in much of the world who depend on that source for food.²¹ The idea of keeping the adaptability and variety of life forms alive is a very significant one, mandated by the Treaty as obligations of *in situ*²² and *ex situ*²³ conservation of biological resources. Certain *ex situ* conservation sites, such as the Missouri Botanical Gardens²⁴ or Kew Gardens²⁵ in London, England, for centuries maintained specimens of plants from all over the world. The Treaty addresses the political effect of these vestiges of colonialism by determining a preference for *in situ* conservation, with *ex situ* conservation occurring in the country of origin of the species. It is a move away from one centralized source which may not itself be very sustainable. If a disaster wiped out Kew Gardens, some other backup repository is needed. It is more logical to develop one in the country of origin of the species, while also developing and training scientists to use research facilities there. The Treaty is moving in a far-reaching way towards an equitable balance affecting many aspects of life and redistribution of scarce resources.

The value of biological diversity is difficult to put into monetary terms, although its economic value as a natural re-

21. A species of wild maize growing in the highlands of Mexico was crossed with North American hybrid corn.

22. *Biological Diversity*, *supra* note 1, art. 9.

23. *Biological Diversity*, *supra* note 1, art. 8.

24. See William Allen Post, *\$20 Million Drive Begun For Garden*, ST. LOUIS POST, Feb. 24, 1993, at 1A; William Allen Post, *Botanical Garden's Wish List Grows; Goal Increased by \$13 Million*, ST. LOUIS POST, Mar. 12, 1993, at 3A.

25. See Stephen Powell, *Unworldly Kew Turns Over a New Leaf*, REUTER ASIA-PACIFIC BUS. REP., Dec. 27, 1992.

source is beginning to be recognized.²⁶ Some economists talk about "contingent valuation."²⁷ Others talk about the "intrinsic value" of biodiversity, such as its spiritual and ethical dimension, or its existence value.²⁸ Proponents of this view may share an anthropomorphic concern about what benefits biodiversity brings directly to humans; they may address both biological and cultural diversity; they may consider a broader view of the value of all life forms, including the smallest microorganism or bacteria, regardless of its known or potential use by humans. From a biological and an anthropocentric point of view, perhaps the most important value of biodiversity is that it provides a storehouse of genetic material, which are raw resources essential to the planet's ability to adapt to change.²⁹

Linked to this exploration of the value of biodiversity is the search for causes of its loss, principally through human activities. Economic factors essential to growth and improved standards of living unfortunately destroy crucial habitats, drive some wild species toward extinction, or encourage monoculture in domesticated species. Each one reduces the planet's biodiversity and alters the delicate balance of ecosystems. Population growth and its attendant pressures on

26. WALT REID ET AL., *BIODIVERSITY PROSPECTING: USING GENETIC RESOURCES FOR SUSTAINABLE DEVELOPMENT* 6-18 (1993).

27. Jeffrey C. Dobbins, *The Pain and Suffering of Environmental Loss: Using Contingent Valuation to Estimate Nonuse Damages*, 43 DUKE L.J. 879, 882 (1994). Contingent valuation is a method used by environmental economists in an attempt to estimate the public's view of environmental resources by creating "... a hypothetical market in which people are asked how much they are willing to pay to preserve or protect a given resource." *Id.* See, Report of the National Oceanic and Atmospheric Administration (NOAA) Panel on Contingent Valuation, 58 Fed. Reg. 4601, 4603 (1993) [hereinafter NOAA Panel Report]. For a more detailed analysis of the methodology, see ROBERT C. MITCHELL & RICHARD T. CARSON, *USING SURVEYS TO VALUE PUBLIC GOODS: THE CONTINGENT VALUE METHOD* (1989).

28. Lee P. Breckinridge, *Protection of Biological and Cultural Diversity: Emerging Recognition of Local Community Rights in Ecosystems Under International Environmental Law*, 59 TENN. L. REV. 735 (1992). For a further explanation of "intrinsic value," see JEFFREY A. MCNEELY ET AL., *CONSERVING THE WORLD'S BIOLOGICAL DIVERSITY* 17-8 (1990); see also NOAA Panel Report, *supra* note 27, at 4602.

29. E. WILSON, *THE DIVERSITY OF LIFE* (1992).

scarce natural resources add to the threat. To reverse this trend, stabilized population, increased education and ecological training, and more equitable distribution of the planet's resources may result in better conservation and sustainable use of biological resources. The application of the precautionary principle in international law may avoid actions that needlessly reduce biodiversity.³⁰ Careful application of biotechnology may in some cases serve as a bridge between conservation and sustainable utilization of biodiversity, as when cross-breeding increases yields of food crops or domestic animals.³¹

While the treaty does not explicitly analyze either the value or the causes of loss of biodiversity, it is grounded in a global perspective which recognizes biodiversity as a common concern of humankind. The three objectives of the Convention on Biological Diversity outline the goals that the international community, individual states, and local communities must seek to implement: the conservation and sustainable use of biological diversity, and the equitable sharing of its benefits.³²

The economic incentive for biological diversity conservation is clear to pharmaceutical companies, agribusiness, and seed companies. Biological Diversity prospecting is potentially worth billions of dollars. For example, if a drug company can discover a medicinal plant growing in a Brazilian rain forest, isolate the gene with healing properties and reproduce it synthetically in the lab, the company can manufacture a drug that will earn large amounts of money.³³ This

30. JEFFREY MCNEELEY, *Critical Issues in the Implementation of the Convention on Biological Diversity*, in WIDENING PERSPECTIVES ON BIODIVERSITY 7, 10 (Anatole F. Krattiger et al. eds., 1994).

31. *Id.*

32. *Biological Diversity*, *supra* note 1, art. 1.

33. Scientists have found a chemical which inhibits HIV in a tropical vine. Susan Katz Miller, *High Hopes Hanging on a 'Useless' Vine; Discovery in Cameroon of a Plant Which May Cure HIV Infection*, NEW SCIENTIST, Jan. 16, 1993, at 12. A treatment for ovarian cancer, Taxol, was found in the bark of a Pacific yew tree. Gary Stix, *Back To Roots: Drug Companies Forage For New Treatments; Plant Derived Pharmaceuticals*, SCI. AM., Jan. 1993, at 142.

process will be protected by intellectual property laws, which the Treaty addresses in some contradictory phrases.

Intellectual property laws are claimed by proponents to encourage development, research, and the advancement of knowledge by creating private property rights. The Treaty claims to observe and respect intellectual property rights. At the same time, the Treaty freely calls for the equitable sharing of the benefits of biodiversity. How can this work? In the example above, someone in a local community, the local healer, told the drug company representative about the medicinal plant or showed it to them. Perhaps a member of an Indian tribe took the drug company representative into the jungle. If this "discovery" resulted ultimately in a successful drug being manufactured by the drug company, according to the Treaty, royalties need to be paid back to the source of that genetic resource.³⁴

II. Legal Duties to Conserve and Sustainably Use Biological Diversity

A. Duty of Conservation and Sustainable Use of Biological Diversity

One of the challenges to lawyers and policy-makers is to apply scientific understanding of the threats to biological diversity to law and decision-making. In the case of the Convention on Biological Diversity, a new norm or binding obligation under international law is created: the conservation and sustainable use of biological diversity. While the meaning of this obligation will become clearer as Contracting Parties draft national biodiversity strategies and legislation, the basic obligation itself has been recognized in the Treaty. Trying to create rules for a subject that is as broad as biological diversity is extremely ambitious and calls for new think-

34. The details will be worked out in the Conference of Parties to the Treaty. The institutional system established by the Treaty is that a body called the Conference of the Parties will meet and vote on matters of implementation and monitoring of the Treaty. Some questions have been raised as to how the benefits can be shared in ways that use indigenous people's knowledge without destroying their traditional way of life.

ing about international law. This new global Treaty recognizes biodiversity as a resource for the preservation of life on the entire planet, and requires global cooperation to conserve and sustainably use it. Biodiversity is certainly not bounded by national territorial boundaries; imagine microorganisms halting at a national border, or the difficulty of detecting seeds or plants being carried through customs by travelers since the earliest human voyages. Yet, implementation of the Biological Diversity Treaty relies principally on national legislation and strategies. It is a pragmatic approach and one that can and will work; however, it fundamentally seems to be a contradiction in terms.

International law is moving away from a narrow conception of national sovereignty, especially on transboundary environmental issues. Yet, national governments themselves must draft strategies and plans to implement the Treaty. The approach is sound, as governments which otherwise may never have considered biodiversity must now include environmental impact assessments of the effect on biodiversity of a proposed activity in their national planning process. Questions about Treaty compliance, lack of global environmental standards, and the responsibilities of national governments vis-à-vis the private sectors within their nations must subsequently be addressed by States who otherwise would not consider such topics. The final assessment of the Treaty's effectiveness will depend on what kind of national legislation on the conservation and sustainable use of biological diversity is enacted and enforced. The IUCN Law Commission in Bonn has been drafting some models and providing technical assistance to States. In addition, the Interim Secretariat for the Biodiversity Convention has been asked by States to produce models of national legislation.

Another indication of serious effort to achieve the goals of the Convention is a commitment that may be idealistic but nevertheless is real and binding. This commitment involves the responsibility of States not to harm the territory of another State or the territory beyond national jurisdiction. Even though a nation state has latitude to create their own legislation and strategies, those that signed and ratified the

Convention have accepted its legal responsibilities and obligations. Since 1972, states have formulated the concept of responsibility accompanying sovereignty in Principle 21. Now, twenty years later, it is binding international law. Any national legislation has to comply with the obligations in Article 3 of the Treaty, the responsibility not to harm the territory of other States. In addition, any domestic legislation or strategy must be consistent with Article 1, "Objectives of the Treaty," the obligation to conserve and sustainably use biological diversity and to equitably share its benefits.

The placement of these overriding, overarching obligations, the Objectives, at the beginning of the Treaty is significant for the Treaty's interpretation and provides the context for each subsequent article. The conservation duties are substantive in the Treaty and many of them relate to our elementary knowledge of biological diversity: The numbers of species and genes and microorganisms contained in a particular habitat, and the extent to which they may be threatened by proposed development. Each contracting party is obligated to start studying and monitoring the biological diversity contained within that State, to count species, and to create databases to share that information. Other articles of the Convention further spell out these responsibilities, as in Article 6 on "General Measures for Conservation and Sustainable Use," Article 8 on "In Situ Conservation," and Article 10 on "Sustainable Use of Components of Biological Diversity." Specific emphasis in the Treaty is given to *in situ* conservation, enumerating measures ranging from the protection of natural habitats, the conservation of viable populations of species in natural surroundings and the establishment of a system of protected areas to the rehabilitation of degraded ecosystems, and recovery of threatened species.³⁵ As part of the sustainability obligations found throughout the Treaty and collected in Article 10, States are obligated to regulate or manage biological resources found within their territory.

35. See *Biological Diversity*, *supra* note 1, art. 8.

B. Jurisdictional Scope

The duties undertaken by Contracting Parties within the territory of a State are to conserve and sustain the use of the components of biological diversity: namely, species, ecosystems and genetic material. Those duties apply within the nation's own territory, the exclusive economic zone and the continental shelf. A differentiation is made in the Treaty for duties on the high seas, in space, or other areas beyond national jurisdiction; there the Contracting Party is responsible to control processes and activities under its jurisdiction or control. The Treaty appears to be silent about activities of a State or its nationals within the territory of other States. This is one of the areas lawyers will need to look at in the future. There is no mechanism under the Biodiversity Treaty's express language to enable non-governmental organizations (NGOs) or individual citizens to directly challenge an activity, a plan, or a development project if it is totally within the territory of another State. A Contracting Party cannot object to another Contracting Party's activity wholly within the second State's territory, unless such activity rises to the level of a clear breach of an international legal duty or violates the Treaty directly.

If the development itself is going to violate the objectives of the Treaty or if a State's Principle 21/Article 3 responsibilities not to harm the territory of another State will be violated by causing some sort of transboundary effect, there would be a basis for triggering the Treaty's dispute resolution mechanisms. The Treaty's dispute mechanisms include conciliation, arbitration, and ultimately resort to the International Court of Justice. The arbitration provisions have potential for resolving the type of situation where economic growth imperatives are competing with the conservation imperatives.

The jurisdictional scope section of the Treaty sketches out areas of responsibility whether within the territory of the Contracting States or in areas beyond national jurisdictions such as the high seas. Article 4 of the Convention on "Jurisdictional Scope" imposes an obligation on States to conserve and sustainably use the components of biological diversity

(species, ecosystems, and genetic material) found within their national jurisdiction, namely a nation's territory, exclusive economic zone, and continental shelf.³⁶ There is no extension of those management obligations to components of biodiversity located within the territory of another State or on the high seas. As to those areas, each Contracting Party is obligated to cooperate on matters of mutual interest.³⁷ Such "matters of mutual interest could include issues associated with migratory species, shared resources, or activities causing transboundary harm."³⁸ A distinction is made regarding the jurisdictional scope over "processes and activities" under the jurisdiction or control of a Contracting Party, whereby the Party is obligated to control its nationals in its own territory and Exclusive Economic Zone or in space and on the high seas (areas beyond national jurisdiction).³⁹ A Contracting Party does not appear to be obligated to control the activities of its nationals within the territory of another State, in which case, there is the duty to cooperate for the conservation and sustainable use of biological diversity.⁴⁰

C. Responsibility of States

A unique feature of the Biological Diversity Convention is the approach "to biodiversity conservation from a development perspective,"⁴¹ moving the spirit of Rio into binding international law. Why is this unique? Since Stockholm, international law recognized sovereign rights over natural resources, while acknowledging a limitation on that right regarding responsibility towards others. The Convention on Biological Diversity marks the first time this principle, Prin-

36. *Biological Diversity*, *supra* note 1, art. 4(a). See, e.g., Melinda Chandler, *The Biodiversity Convention: Selected Issues of Interest to the International Lawyer*, 4 *COLO. J. INT'L ENVTL. L. & POL'Y* 141, 147 (1993).

37. *Biological Diversity*, *supra* note 1, art. 5.

38. Chandler, *supra* note 36, at 148.

39. *Biological Diversity*, *supra* note 1, art. 4.

40. Note that activities of foreign nationals would be subject to laws and regulations of the State in which they are present or operating.

41. Françoise Burhenne-Guilmin, *An Introduction to the Convention on Biological Diversity*, in *WIDENING PERSPECTIVES ON BIODIVERSITY*, 15, 16 (Anatole F. Krattiger et al. eds., 1994).

ciple 21 of the Stockholm Declaration, has been included in a multilateral Treaty, thereby becoming legally binding international law without the necessity of debating whether the principle is customary law or not. The final text of the biodiversity treaty, specifically Article 3, adopted Principle 21 verbatim, a significant step towards consensus by both developed and developing countries. Significantly under the Convention, Contracting Parties do accept broad 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."⁴² This article works in conjunction with the responsibilities of States with respect to their own biological resources.⁴³

D. Role of Non-Governmental Organizations

Non-state groups, such as non-governmental organizations, international bodies, groups of scientific or technical or legal experts, indigenous people, women, and local communities, are also identified as contributing to the implementation of these goals through various levels of participation. Procedural rights included in the convention reflect this concern for the involvement of global civil society,⁴⁴ such as environmental impact assessments and involvement in monitoring and research.⁴⁵

All States beginning a project likely to affect biodiversity, cooperating in remediation, or providing technical assistance must make a full assessment of the internal, transboundary, and global environmental impacts such activities might present. Developing States, in which most of the planet's biodiversity is found, are called upon to adopt effective domestic environmental impact assessment procedures, if

42. *Biological Diversity*, *supra* note 1, art. 3.

43. STIG BLIXT, *The Role of Genebanks in Plant Genetic Resource Conservation under the Convention on Biological Diversity*, in *WIDENING PERSPECTIVE ON BIODIVERSITY* 255, 257 (Anatole F. Kratigger et al. eds., 1994).

44. See RICHARD FALK, *EXPLORATIONS AT THE EDGE OF TIME* (1992).

45. For a description of this level of citizen involvement and Federal agency rulemaking in the US related to biodiversity conservation, see Robert L. Fishman, *Biological Diversity and Environmental Protection: Authorities to Reduce Risk*, 22 *ENVTL. L.* 435 (1992).

they have not already done so, and apply them to biological diversity. States with experience in domestic impact assessment could assist other States in the development of such regimes, if they so request. Private parties and government agencies can voluntarily subject their activities to environmental impact assessment procedures, whether required by law or not. An example is where ecologists are trying to minimize the impact on fragile ecosystems of ecotourism, which is otherwise desirable due to the many economic and aesthetic benefits of such travel to the host nation and to the traveller.

At the 1992 United Nations Conference on Environment and Development (UNCED), participating States affirmed the importance of environmental impact assessment (EIA) procedures as an integral part of the development process.⁴⁶ Currently, more than seventy-five States require EIA as a matter of domestic law. In addition, international organizations, such as the World Bank, have adopted EIA procedures as part of their decision-making process. The popularity of EIA is due, in large measure, to its usefulness in providing environmental information to decision-makers from people outside government or business who are proponents of the project. While EIA procedures often provide local communities that might be affected by a project with the opportunity to participate in the decision-making process,⁴⁷ following the procedure does not always guarantee effectiveness in anticipating and mitigating the adverse environmental impacts of development projects.

E. Duty to Create National Biodiversity Plans

The Treaty does not mandate anything resembling global resource management, and does not create any institutional

46. See Rio Declaration on Environment and Development, Princ. 17, U.N. Doc. A/CONF.151/5 (1992), reprinted in 31 I.L.M. 874 (1992). Principle 17 states, "[e]nvironmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority." *Id.*

47. See generally Nicholas A. Robinson, *International Trends in Environmental Impact Assessment*, 19 B.C. ENVTL. AFF. L. REV. 591 (1992).

entity which could accomplish such a task. However, the Convention does require Contracting Parties to draw up national biodiversity plans and strategies, including national legislation, to implement the Convention. The Convention also establishes the right of universal access to genetic resources, regardless of their physical location within territorial boundaries of nation-states, and combines it with access to transfer of technologies and financial resources to meet the Convention's obligations.⁴⁸

The benefit-sharing provision is another break-through, recognizing the global imperative to share both products and profits from life-saving medications, nutritionally adequate and improved foods, and the raw materials for further development of such products. Once these basic premises of responsibility and sharing are accepted, as they are in the final text of the Convention on Biological Diversity, it is then the responsibility of diplomats, politicians, and ordinary citizens to find the means to achieve these ends, using traditional knowledge as well as the most advanced science available to us. Greater international cooperation will benefit those who participate; those who choose not to share need not cooperate, however, they will be denied access to the resources the others have. In a mutually interdependent world, such "play it alone" tactics will not work for long.

III. Legal Duties to Equitably Share the Benefits of Biodiversity

A. Transfer of Technology

One example of biotechnology is the "Flavr-savr" tomatoes,⁴⁹ genetically engineered tomatoes which vine-ripen and do not rot by the time they reach the market. Another example is bovine growth hormones used in cows to increase production of milk.⁵⁰ These techniques alter nature through

48. *Biological Diversity*, *supra* note 1, art. 15.

49. See *AGBIO News: FLAVOR SAVR Tomato*, *APPLIED GENETICS NEWS*, Apr. 1993.

50. *Interim Voluntary Guidance on BST Issued by FDA for Milk Producers*, 17 *Chemical Reg. Rep. (BNA)* 1916 (Feb. 11, 1994).

genetic engineering and gene splicing. Biotechnology has been used as long as there have been humans on this planet cross-breeding plants and animals. The farmer uses biotechnology in creating hybrid seeds and breeding animals for improved qualities. In one sense, the practice is very ancient and, in another sense, it is very new. Biotechnology is one option or means of achieving the conservation and sustainable use of biodiversity.

The transfer of technology aspect of the Treaty probably has the best capacity to fulfill the goals of the Treaty, so long as handled in a voluntary way with the cooperation of the private sector in providing the best appropriate technology. States can support, encourage, and assist the private sector in the transfer of technology in ways that are beneficial to the entire planet. The Treaty does not clearly mandate that a government go to a private corporation and force it to turn over certain technology for transfer to a developing nation. Private sector groups and companies have an incentive to cooperate because, in return, they acquire access to genetic resources, which they desire and need for commercial growth and profits in market economics. Thus, the transfer of technology is a two-way street.

In addition, many developing nations have sources of traditional knowledge and ways of using resources sustainably, as well as, technology that can be transferred to the developed world. Technology transfer refers not only to industrial technology being transferred from developed to developing countries, but also to traditional or appropriate technology being transferred from developing to developed countries. It may not be the most sophisticated or expensive technology that is needed to conserve biodiversity; in many situations low-cost, low-technology solutions may be best.

In return for access to genetic resources, the Treaty provides for the transfer of environmentally-sound and relevant technologies and financing for projects related to achieving the objectives of the Convention. For those States rich in technology and finances (principally in the developed world), there is an incentive to contribute these economic resources for conserving and sustainably using biological diversity in

those States richest in genetic resources (principally in the developing world). The incentive for developed countries is the right of access to genetic resources, an economically valuable item, and the raw material necessary to the continued growth of pharmaceutical companies and agribusiness in developed countries. The incentive for developing countries to meet their Treaty obligations is to equitably share in the benefits of the use of biodiversity, by providing for compensation in the form of royalties for products derived from traditional knowledge and the knowledge of indigenous people and local communities. Hence, the Convention recognizes that technology transfer goes both ways. As a result, we all gain—the human and other populations of the globe and the planet itself—from compliance with the norm of conservation and sustainable use of biological diversity.

B. Financing

A highly contentious issue continues to be the choice of a financial mechanism under the Convention. The financial burden of compliance with these treaty obligations for developing States is obvious, especially if they are being asked to forego economic development, because it is destructive of biodiversity. Thus, the financial mechanism established under the Treaty⁵¹ is necessary to fund projects of this nature. At the final negotiating session on the Treaty, the Global Environment Facility (GEF), a joint project of the World Bank, UNDP, and UNEP, was adopted as an interim financial mechanism, despite severe opposition from many developing nations.

Developed countries, as the major donors, generally favor the GEF, with its weighted voting system. Developing countries by and large remain skeptical, regardless of whether the recent restructuring of the GEF can address their fundamental objections to the lack of transparency and democracy in the body. Alternative financial mechanisms have been proposed by some states, including an independent biodiversity fund under the Convention or a UNEP biodiversity trust

51. *Biological Diversity*, *supra* note 1, art. 21.

fund, both of which could accommodate contributions from NGOs and individuals as well as governments.⁵²

IV. Unresolved Issues

To comply with the Convention, each State must collect data on genes, species, and habitats occurring within its boundaries and to conserve genetic resources both *in situ* in protected areas and *ex situ* in gene banks, preferably within the country of origin of the specimens. Unresolved, however, is the question of ownership of, access to, and allocation of scarce resources for *ex situ* conservation. For example, the herbarium at Kew Gardens in London, England, is a model repository of plant specimens from around the globe, which are preserved under optimal conditions.

The herbarium of Kiev, now the Ukraine, has many specimens from the region, but the government has had no funds for many years to preserve the collection. The importance of the collection in Kiev, and a compelling argument for maintaining *ex situ* collections, both in the Ukraine and in London, can be illustrated by the nuclear accident at Chernobyl. Plants growing in the area of the disaster were measured for radioactivity and compared to specimens held in Kiev which had been collected prior to the accident. DNA from the Kiev specimens was studied to watch for any mutations appearing in the plants growing around Chernobyl after the accident. Had the nuclear accident affected Kiev, the herbarium there could have been destroyed, illustrating the need for a facility such as Kew Gardens, even if local facilities exist. Each collection may preserve different specimens, or provide greater context for the collection. This treasure house of genetic material is simply too precious for the survival of life on our

52. No donor States have committed to make contributions to any financial mechanism other than the GEF. To date, total pledges to GEF replenishment over the next four years total \$2 billion, of which some \$430 million is to come from the United States. These funds are not dedicated exclusively to biodiversity, however, as GEF funds projects on climate change, ozone, and other areas in addition to biodiversity. See *Convention on Biological Diversity, 1994: Hearing Before the Committee on Foreign Relations*, 103rd Cong., 2d Sess. 5 (1994) (statement of Timothy Wirth, Counselor, Department of State).

planet to take chances with it. Of course, international funding to protect the specimens at Kiev from disintegration should be provided both to foster the local research and as a backup to facilities like Kew Gardens.

The Convention on Biological Diversity suggests a mechanism for seeking such funding through the financing provisions of the Treaty. The goal of such a project is clearly in line with the conservation provisions of the Treaty, specifically Article 7 Identification and Monitoring, Article 9 *Ex situ* Conservation, and Article 12 Research and Training. One of the open issues for discussion at the first Conference of the Parties, and probably at many others still to come, is the question of ownership of seed banks and other *ex situ* collections of genetic resources, and who has access to them. The previous work of the Food & Agriculture Organization's International Undertaking on Plant Genetic Resources⁵³ may need to be renegotiated to bring it into harmony with the Convention on Biological Diversity regarding ownership of and access to *ex situ* genetic resources, as well as farmers' rights.

Another major concern, which was part of each meeting of the negotiating body and the ICCBDs, and which will undoubtedly continue to appear on the agenda of successive Conferences of Parties, is that of biosafety and the need for a protocol on the subject.⁵⁴ There appear to be two camps now, the G-77 and the OECD. The G-77 and other nations concerned about the release of untested or uncontrollable genetically modified organisms within their territory, want strict regulations and rules to avoid disaster. For years the United States has strictly maintained that there is no danger at all from biotechnology, and therefore, no need for a protocol. This position has been modified by the OECD countries, generally to that of a gradual approach to the question of regulation, with the EU in support of drawing up short-term technical guidelines on biosafety. This issue, of course, raises

53. *International Undertaking on Plant Genetic Resources, Report of the Council of FAO*, at 71-75, U.N. Doc. C84/REP (1983).

54. The treaty contains one article on how biotechnology should be handled and its benefits distributed. *Biological Diversity*, *supra* note 1, art. 19.

ethical and socio-economic questions related to genetic alteration and the locus of decision-making power. For example, news accounts from a consumer perspective have highlighted concerns over the use of bovine growth hormone and its effect on milk and beef for human consumption. Additionally, other concerns have been raised over the labelling of genetically-engineered tomatoes and other foods. Scientific debate, as well as ethical and moral concerns, have been raised about destroying the small-pox virus, which is technically feasible.

It remains to be seen what action on transfer of technology and intellectual property rights is specifically required of each State party to the Treaty in relation to the private sector within its boundaries or in relation to multinational corporations operating within the State's boundaries. Such questions are broadly subject to the Biodiversity Treaty's article on "Jurisdictional Scope."⁵⁵ A corporation holding a patent to technology relevant to the goals of the Treaty may not want to relocate its plant or research labs to a developing country which lacks infrastructure, or may not want to transfer technology to anyone within a nation which lacks legal protection for intellectual property. If a government wants to force that patent-holder to transfer the technology, what must be transferred: only the final product; or managers and technical consultants to advise local producers; or the entire manufacturing process and machinery? The Convention offers little or no guidance since the language of the Treaty must be implemented through national legislation and, in fact, appears to be contradictory within sections of key articles like Articles 15 and 16. One less desirable answer to this hypothetical is to decide that the government of the State where the corporation has its principal place of business need do nothing, because there is no "mutual agreement" as required by Article 15, and therefore no transfer of technology is mandatory under the Treaty.

Another option is to interpret the requirement that Contracting Parties "provide and/or facilitate" the transfer of technology to mean that the government should encourage its

55. *Biological Diversity*, *supra* note 1, art. 4.

private sector to comply through one of a range of escalating measures, both positive, such as tax incentives or ecosystem trading permits, and negative, such as public or private exhortations, threat of sanction, denial of export licenses or government contracts. A final option would be compulsory licensing of the technology by a national government.⁵⁶ This would make the technology freely available to the public in the place from which access to genetic resources is sought. Obviously, this option raises many fears and questions about compensation to the patent-holder, the extent of the duty, and its breadth of applicability, whether to all companies from the State of which the patent-holder is a national or only to that patent-holder.⁵⁷ In actuality, many companies may wish to voluntarily transfer relevant technology to some degree in order to capitalize on a business opportunity. Others may propose to share their patented technology in return for payment from a government or from the financing mechanism established under the Convention, depending on how the eligibility requirements are drafted and at what price level compensation is set. A monopoly may not want to accept a payment the financing mechanism considers adequate or fair. Practice will no doubt calm many fears, and others can be addressed by clarifications when the Conference of the Parties meets.

At the time of the signing of the Convention in Rio in June, 1992, several States filed declarations to explain their position or highlight remaining areas of contention in interpreting the language just adopted in the final text. Malaysia, for example, entered a declaration objecting to the language of Article 16(2) asserting that it failed to reflect its insistence

56. The Treaty language does not require the government of the State of which the patent-holder is a national to compel the transfer of technology because of the limitation in Article 4 on "Jurisdictional Scope" regarding activities in the territory of another state. Therefore, compulsory licensing or expropriation would only be done, if at all, by the government of a State where the patent-holder is operating as a foreign national. *Biological Diversity*, *supra* note 1, art. 4.

57. When the U.S. refused to sign the Convention at Rio in 1992, the government of Venezuela responded by expelling those American companies then involved in biodiversity prospecting in Venezuela.

that the transfer of technology must be on concessional and preferential terms. The United States did not sign the treaty at all in Rio contending that the text was "seriously flawed" in several areas, including transfer of technology and intellectual property rights provisions.⁵⁸

Some of the confusion in the text of the Treaty stems from the last-minute adoption of subparagraphs necessary to complete the negotiations and have a final document ready for signing during the Earth Summit. Some confusion is also related to the failure of the negotiators to identify and resolve their position on a fundamental underlying question related to intellectual property rights: whether legal regimes protecting private property rights in inventions and discoveries help conserve and sustainably use biological diversity, or do these laws hurt the objectives of the Treaty? Absent a consensus on this question, which clearly was not present or in Nairobi at the final negotiating session or subsequently, it is difficult to interpret the language of Articles 15 and 16 in light of the Article objectives of the Treaty.

The use of the best and most appropriate technology is one way to conserve and sustainably use biological diversity. This functions by reducing the destructive effect of human activity on genetic resources in situations where clearly some technology is going to be used and will alter an ecosystem. The goal is to limit the effect of the human activity on the ecosystem to as great an extent as possible by using the most modern processes, materials and products available. Inevitably, these will be protected by patents in developed countries. In this scenario, the task is to facilitate the transfer of this technology. An example related to biodiversity is the policy decision by the Chinese government to build the Three Gorges Dam,⁵⁹ which floods out villages, displace persons, and destroy priceless archeological sites with artifacts related to one of the earliest stages of Chinese civilization. Archaeologists excavating sites which will be destroyed forever have

58. The U.S. signed a year later, on June 4, 1992, but has not yet ratified the Convention.

59. Kevin Huyser, Note, *Sustainable Development: Rhetoric and Reform at the World Bank*, 4 J. TRANSNAT'L L. & CONTEMP. PROBS. 253, 270-71 (1994).

compared this to the building of the Aswan Dam, and have asked for aid and contributions from the international community to remove some of the treasures before the waters rise.⁶⁰ The Chinese government, while assisting the excavations, is concerned with providing hydroelectric power for the economic growth of the nation and the electrification of Chinese homes.⁶¹ If this policy decision is consistent with the obligations of conservation and sustainable use under the Convention, then the question of the transfer of the best available technology from whatever source should be addressed.

Access to technology is linked to access to genetic resources in the Treaty, but require complex legislation and administrative programs in many nations that currently lack such legal and institutional capacity. Such legislation, for example, must authorize government officials to enter into material transfer agreements with foreign corporations; to develop provisions for restricting resale of uses of biological resources or licensing their use; and to prohibit unauthorized transactions or uses of biodiversity. For example, a private contract between Merck and INBIO,⁶² a quasi-governmental research institute in Costa Rica, has often been described as a model of cooperation, whereby parataxonomists trained by INBIO from local communities locate plant specimens for Merck, which then has the right to export them. In addition to a lump-sum initial payment, Merck has promised to pay a small percentage of royalties from any commercially-successful drugs resulting from genetic material extracted from INBIO plants. There are several unresolved questions which may limit the utility of this model as a panacea, including the current inability to identify the source of genetic material to support a claim for royalties in the future; issues relating to protection of traditional lifestyles and knowledge and compensation for the use of its benefits; and ethical and moral as

60. *Id.*

61. *Id.*

62. See Michael D. Coughlin, Jr., *Using the Merck-INBIO Agreement to Clarify the Convention on Biological Diversity*, 31 COLUM. J. TRANSNAT'L L. 337 (1993).

well as economic issues arising from “biodiversity prospecting.”

From a legal standpoint, there are a number of theoretical questions underpinning the language of the Treaty which remain unanswered and unanalyzed, which may plague efforts to interpret or implement the Convention.⁶³ International lawyers, diplomats and NGOs will need to consider and closely analyze topics such as the following: the inherent tension between sovereign rights and responsibility as contained in Principle 21 of the Stockholm Declaration; the anthropocentric focus of the Treaty and the Rio Declaration, which is contrary to non-hierarchical concepts of diversity. In addition, these parties must consider scientific knowledge as the basis of law and policy where the data base does not exist or cannot yet be interpreted, and the application of the precautionary principle, which suggests that the only way to conserve and sustainably use biological diversity with certainty may be to avoid its use until further scientific knowledge develops.

63. To illustrate the US government view of difficulties under the Convention, see generally Chandler, *supra* note 36.