

TOURO JOURNAL OF TRANSNATIONAL LAW

Vol. 4

TOURO COLLEGE

JACOB D.
FUCHSBERG
LAW CENTER

1993

NEW DIPLOMACY FOR THE BIODIVERSITY TRADE: BIODIVERSITY, BIOTECHNOLOGY, AND INTELLECTUAL PROPERTY IN THE CONVENTION ON BIOLOGICAL DIVERSITY

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INTRODUCTION

Negotiations on the Convention on Biological Diversity¹—
signed by over 150 nations in Rio de Janeiro in June 1992²—

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The author is grateful to Susan Bragdon, Don Goldberg, Gareth Porter, Walt Reid, and Chris Wold for their thoughtful comments and is also grateful to

often revolved around the allocation of perceived economic benefits from biotechnological exploitation of biodiversity, sometimes to the neglect of the overall agenda of conservation of nature.³ The debate centered on what can be called the international "biodiversity trade," which raises several issues linking biodiversity and biotechnology.⁴ First, how should the economic benefits of biodiversity be distributed among nations? In particular, how should biotechnology based on genetic resources—the

Amy Weinhouse for her research assistance. Errors are, of course, the author's property.

1. *Opened for signature*, June 5, 1992, 31 I.L.M. 822 (1992) [hereinafter Convention]. For the text of the Convention, see *INTERNATIONAL CONVENTION, CONVENTION ON BIOLOGICAL DIVERSITY*, which immediately follows this article.

2. The Convention on Biological Diversity has been signed by 162 countries, including the United States plus the European Community. See *United Nations Environmental Programme*, Intergovernmental Negotiating Committee for a Convention on Biological Diversity, 5th Sess., at 1-7, U.N. Doc. ST/LEG/SER.E/10/ Supplement (1993) (copy, obtained from UN Treaty Office, on file with CIEL).

3. Biodiversity is a contraction of the term "biological diversity," defined in the Convention 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." Convention, *supra* note 1, art. 2. As defined, it would appear to encompass the term "genetic resources" as defined under the Convention. See *infra* notes 11-25, 36-38, and accompanying text.

4. The term biodiversity trade is used in this article to refer to international movement of components of biodiversity with the purpose of eventually reaping commercial benefits based on their character as expressions of biodiversity. It includes, for instance: (1) shipment of samples of tropical rainforest plants to industrialized countries for analysis in pharmaceutical labs for active compounds; (2) international shipment of samples of traditional crop varieties for use in breeding of new plant varieties; (3) export of samples of genetic variety for use in creating commercial products through biotechnological manipulation. So defined, it does not include international bulk shipment of grain, regardless of its genetic variety, for use as food. It is also distinct from trade in endangered species regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora, see *infra* note 79, although transfers of specimens of endangered species could occur within the biodiversity trade.

ultimate source of all biodiversity—be transferred or shared between the countries in which the biotechnology is developed and the countries from which the genetic resources are taken? A related issue was what rights of access do countries have to genetic resources in other countries? In particular, the relationship between these issues and intellectual property rights was one of the “most divisive issues” in the treaty negotiations.⁵

This article proposes some actions the parties to the Convention could take to deal with these issues. Part I briefly reviews the negotiations on the biodiversity trade and the resulting text of the Convention. Part II offers a preliminary critique of the terms of this debate, aimed at helping future negotiators break negotiating deadlocks and reach agreement on concrete measures to carry out the Convention’s basic principles. Part III includes proposals for specific actions both at the multilateral level by the Conference of the Parties— through protocols or administrative structures under the treaty’s framework—and at the domestic level by individual parties, through implementation of the treaty.

This article suspends judgment on more radical critiques of the biotechnological commercialization of biodiversity, such as the argument that proprietary biotechnology inherently leads to excessive and inequitable concentration of economic power,⁶ that it may contribute to erosion of genetic diversity,⁷ or that biotechnological manipulation of genetic resources and patenting of the results constitutes a dangerous and dehumanizing commodifica-

5. See Melinda Chandler, *The Biodiversity Convention: Selected Issues of Interest to the International Lawyer*, in 4 *COLO. J. INT’L ENVTL. L. & POL’Y* 141, 161 (1993).

6. See, e.g., Hope Shand, *There Is a Conflict Between Intellectual Property Rights and the Rights of Farmers in Developing Countries*, 1991 *J. AGRIC. & ENVTL. ETHICS* 132; Vandana Shiva, *Biodiversity, Biotechnology and Profits*, in VANDANA SHIVA ET AL., *BIODIVERSITY: SOCIAL & ECOLOGICAL PERSPECTIVES* 43, 51 (1991); HENK HOBELINK, *BIOTECHNOLOGY AND THE FUTURE OF WORLD AGRICULTURE* (1991); JACK DOYLE, *ALTERED HARVEST: AGRICULTURE, GENETICS AND THE FATE OF THE WORLD’S FOOD SUPPLY* (1985).

7. See DOYLE, *supra* note 6.

tion of humanity and life⁸ or that it amounts to immoral tampering with the handiwork of nature or God.⁹ There are powerful arguments for strict control over biotechnological research and for a reexamination of—and possibly a scaling-back of—intellectual property laws that facilitate corporate ownership of living things. While acknowledging these related and distinct issues, this article, however, works from the assumptions underlying the Convention: that commercial trade and use involving biodiversity, including biotechnology, can contribute to sustainable development; and that they can serve as positive incentives to conservation. The practical reality is that these are the legal principles we are left to work with after prolonged international debate.

I. THE DEBATE ON THE BIODIVERSITY TRADE IN CONVENTION NEGOTIATIONS

If the term “biodiversity” is mentioned in the North in the United States or Europe, the term will conjure up images of dense rainforests, alarming rates of extinction and vast numbers of unknown species. If it is mentioned in the South, many people will think of traditional crop varieties, biotechnology, genetic imperialism, multinational corporations and the General Agreement on Tariffs and Trade (GATT).¹⁰

8. See, e.g., ANDREW KIMBRELL, *THE HUMAN BODY SHOP: THE ENGINEERING AND MARKETING OF LIFE* (1993).

9. For moral arguments against biotechnology and the assertion of ownership over living things through “life patenting,” see JEREMY RIFKIN, ALGENY (1983); *The Genome Project: The Ethical Issues of Gene Patenting: Hearings Before Subcomm. on Patents, Copyrights, and Trademarks of the Senate Comm. on the Judiciary*, 102d Cong., 2d Sess. (1992) (statement of religious leaders against animal patenting to the House Judiciary Committee Subcommittee on Courts, Civil Liberties & the Administration of Justice, Jul. 27, 1987, *quoted in* testimony of Andrew Kimbrell (Foundation on Economic Trends) before the Judiciary Subcommittee on Patents, Copyrights and Trademarks); *Id.* (statement of Sen. Hatfield introducing bill imposing moratorium on animal patenting, *quoted in* Kimbrell testimony).

10. WALTER V. REID, *GENETIC RESOURCES AND SUSTAINABLE AGRICULTURE: CREATING INCENTIVES FOR LOCAL INNOVATION AND ADAPTATION 1* (1992).

A. The Biotech/Biodiversity Debate

Many countries with significant "genetic resources"—i.e., high diversity of wild species of plants and animals or varieties of domesticated crops and their wild relatives—hoped that the Convention would sanction greater sharing of the economic benefits derived from genetic resources. These countries complained that for too long the North had treated tropical genetic resources as a "common heritage" free to all, using it to improve crop varieties and otherwise add value to agriculture and industry without paying any compensation to the countries from which the genetic resources came.¹¹ They argued that they deserved to share in the rewards that biotechnology promised to reap from the manipulation of their biodiversity. Having most of the world's biodiversity within their borders, they emphasized the right of sovereign nations to control access to their own natural resources, including genetic resources. These countries also rejected the application of the common heritage doctrine to those resources.¹²

In the environmental community, many embraced the principles of increased sharing of benefits and compensation for use of genetic resources. Their enthusiasm was based not only on the argument from equity but also on the theory that such economic rewards would serve as incentives to conserve biodiversity and to encourage governments to protect rainforests and other biodi-

11. For reviews of this argument, see, e.g., REID, *supra* note 10; John H. Barton & Eric Christensen, *Diversity Compensation Systems: Ways to Compensate Developing Nations for Providing Genetic Materials*, in *SEEDS AND SOVEREIGNTY: THE USE AND CONTROL OF PLANT GENETIC RESOURCES* (Jack R. Kloppenburg, Jr. Ed., 1988).

12. This was something of an about-face from earlier discussions, when developing countries had tried to apply the common heritage doctrine to improved crop varieties developed in industrialized countries to justify the free transfer of those varieties to the developing world. Under that approach, developing countries had supported—against objections from industrialized countries—the 1983 International Undertaking on Plant Genetic Resources, which states that "plant genetic resources are a heritage of mankind to be preserved, and to be freely available for use, for the benefit of present and future generations." *Report of the Conference of the FAO*, U.N. Food and Agriculture Organization, 22d Sess., U.N. Doc. No. C 83/Rep. (1983) (Rome, 5-23 Nov. 1983).

versity-rich ecosystems from conversion to alternative uses, like logging or ranching.

In the context of the North-South debate on genetic resources, developing countries argued that intellectual property rights ("IPR") over biotechnology were a major obstacle to equitable sharing and conservation. These countries complained that protection of IPR blocks the sharing of biotechnology's benefits through the international transfer of biotechnology because it increases the price that private owners of the technology—nearly all based in industrialized countries—can charge for its transfer through licensing of patent rights. It is particularly unfair, developing countries have said, for developed countries to insist on strong protection of IPR for biotechnology inventions while declining to recognize that developing countries have analogous property rights over genetic resources within their territory. Thus, developing countries pressed for provisions in the Convention that would limit or reduce IPR over biotechnology derived from genetic resources so as to encourage technology transfer.¹³

On the other hand, industrialized countries (with existing or potential biotechnology industries of significance) argued that IPR protection ensures a fair reward for innovation and actually increases the technological benefits of biodiversity. IPR protection increases incentives for technological innovation because it ensures profits to investors in research and development that might otherwise be lost if competitors could "reverse engineer" a biotechnological product and undercut the innovator's prices by avoiding the costs of research and development. In particular, IPR protection creates incentives to develop biotechnological applications based on genetic resources by increasing the profits from commercializing those applications. Thus, industrialized countries argued that IPR protection promotes conservation by enhancing the commercial value of the genetic resources contained in biodiversity.

For similar reasons, industrialized countries argued that strong IPR regimes in developing countries stimulate technology transfer

13. See Chandler, *supra* note 5, at 161.

or diffusion: IPR-holders will have a greater incentive to move the technology into new markets if they know that they will not be threatened by "pirates" who reverse-engineer the product and undersell the IPR-holder. Ultimately, the Bush administration cited the supposed threat that the Convention posed to intellectual property rights of the U.S. biotechnology industry as a principal reason for declining to sign the treaty.¹⁴

The distribution of commercial benefits of biodiversity and the ownership of biodiversity and its commercial applications are the subject of debate in other contexts as well. The issues have been raised in discussions of intellectual property in GATT, for instance, and are regularly discussed by the members of the UN Food and Agriculture Organization. Similarly, the dispute over IPR ranges beyond the biotechnology sector and is being played out in several forums, as industrialized countries—especially the U.S.—press for stronger IPR to safeguard profits that their industries reap from more advanced technology, while developing countries seek to preserve weaker IPR systems, which they argue are better suited to their level of development.¹⁵

B. The Resulting Text of the Convention

The final text of the Convention that resulted from this debate is muddled, vague, and inconsistent, even by the relaxed standards of international agreements. In many instances, it merely

14. See Russ Hoyle, *Deep-Sixing Biodiversity*, 10 *BIO/TECH.* 848 (1992); United States: Declaration Made at the United Nations Environmental Programme Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity, 31 *I.L.M.* 848 (1992) (Nairobi Final Act, May 22, 1992); GARETH PORTER, *THE UNITED STATES AND THE BIODIVERSITY CONVENTION: THE CASE FOR PARTICIPATION* (1992).

15. IPR has been a major issue in the Uruguay Round of talks on the GATT, Oct. 30, 1947, T.I.A.S. No. 1700, 55 *U.N.T.S.* 187, and in negotiations between the U.S. and Mexico on the North American Free Trade Agreement, Sept. 17, 1992, available in WESTLAW, NAFTA database. The U.S. has also threatened or brought "Section 301" sanctions against trading partners on the ground that they fail to enact or enforce adequate protection of IPR. See Robert Housman & Durwood Zaelke, *Trade, Environment and Sustainable Development: A Primer*, 15 *HASTINGS INT'L & COMP. L. REV.* 535, 591 (1992).

memorializes rather than resolves the deadlocks that characterized the negotiating process. Nevertheless, it establishes, in general terms, several important principles regarding these interrelationships.¹⁶

1. Genetic Resources Access and Benefit Sharing

First, countries must “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.”¹⁷ Second, countries obtaining genetic resources from other countries must do so on “mutually agreed terms,” obtaining “prior informed consent.”¹⁸ Third, buyers and source countries must arrange for “fair sharing” of the benefits derived from genetic resources—i.e., compensation for their use.¹⁹

In these provisions, the Convention rejects the “common heritage” doctrine that has traditionally been applied to genetic resources.²⁰ This new approach to control of a previously common resource paves the way for commercial trade that could, in theory

16. In addition to the principles discussed below, the treaty provides that parties must consider the need for a protocol to establish uniform procedures for “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.” Convention, *supra* note 1, art. 19(3). Because this aspect of the biotech/biodiversity debate is not directly related to the terms of biodiversity trade, it is not discussed in this article.

17. *Id.*, art. 15(2) (emphasis added).

18. *Id.*, arts. 15(4), (5).

19. “Each Contracting Party shall take . . . measures . . . with the aim of sharing in a fair and equitable way the . . . benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources.” *Id.*, art. 15(7). In addition, Article 19(2) provides that each party “shall take all practicable measures to promote . . . 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.” *Id.*, art. 19(2). Both these provisions specify that access “shall be on mutually agreed terms.” *Id.*, arts. 15(7), 19(2).

20. Compare, for instance, the 1983 International Undertaking on Plant Genetic Resources. See *supra* note 12.

at least, provide incentives to preserve biodiversity-rich ecosystems in hopes of realizing economic returns from exploitation of the genetic resources that they contain.

On the other hand, the Convention does not treat genetic resources as a type of property like any other natural resource. The control of a sovereign nation over resources within its own jurisdiction is limited by the obligation under Article 15(2) to facilitate access by other countries to genetic resources.²¹ In this respect, the developed countries prevailed against the biodiversity-rich countries' desire to assert complete control over their genetic resources.²²

The North won another battle over treatment of samples of crop varieties already collected and stored in "seed banks" or "gene banks," many of which are situated in the North and all of which traditionally give free access to their collections.²³ Crop genetic variety is one of the types of biodiversity with the greatest proven commercial value. Under the Convention, genetic resources already collected and stored in these banks are excepted

21. Convention, *supra* note 1, art. 15(2).

22. The industrialized countries' insistence on access is not surprising given that the Convention requires them to fund biodiversity conservation in developing countries. See John H. Barton, *Biodiversity at Rio*, 42 *BIOSCI.* 773, 775 (1992).

23. Many thousands of traditional crop varieties and wild relatives have been collected in these "seed banks" or "gene banks" to which Northern agribusiness currently has free access. Approximately fifty countries have established facilities for long-term storage of "plant genetic resources," principally covering genetic diversity relevant to major food crops. KEYSTONE CENTER, KEYSTONE INTERNATIONAL DIALOGUE SERIES ON PLANT GENETIC RESOURCES, OSLO PLENARY SESSION: FINAL CONSENSUS REPORT: GLOBAL INITIATIVE FOR THE SECURITY AND SUSTAINABLE USE OF PLANT GENETIC RESOURCES 7 (1991). Twelve of the International Agricultural Research Centers, linked through the Consultative Group on International Agricultural Research, have collections of plant genetic resources. While erosion of genetic resources held in such storage facilities is a worldwide problem, collections of crop genetic resources are far from complete (and are especially weak for minor crops), *id.* at 7-8, 19, and *ex situ* conservation of genetic resources of trees and domesticated animals is even less adequate, the fact remains that U.S. agribusiness can count on substantial reserves of genetic variety for use in developing new products for a long time to come.

from the rule that users of genetic resources must obtain the informed consent of the country where those genetic resources originated and pay benefits to that country.²⁴ Thus, agribusiness and public sector researchers in the industrialized world will be able to continue to use these collections with no obligation to the country of origin.

2. Traditional Knowledge

A fourth principle enunciated in the Convention regards traditional knowledge "embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity."²⁵ Article 8(j) requires parties to "promote [the] wider application" of traditional knowledge "with the approval and involvement of [its] holders" and to "encourage the equitable sharing of the benefits" of the use of such knowledge.²⁶ While the language is murky and verbose, it would support measures to return a share of commercial profits to traditional knowledge holders whose knowledge contributed to development of a sustainable use. For instance, if a pharmaceutical company develops a useful drug relying in part on indigenous people's knowledge of the medicinal use of a related natural compound, regulations might require the company to return a share of the profits to the indigenous people.²⁷

24. Convention, *supra* note 1, arts. 2, 15(3).

25. *Id.*, art. 8(j).

26. *Id.*

27. Derivation of a drug from a wild plant is a classic case of a sustainable use of biodiversity, as long as it does not lead to overharvesting of the source plant in the wild or to large-scale cultivation of the plant that displaces natural habitat.

3. Technology Transfer²⁸

Finally, the Convention requires treaty parties to "provide and/or facilitate" transfer to other parties of biotechnology derived from genetic resources.²⁹ The Convention also requires transfer of biodiversity-protection technology, but the greater emphasis by far is on genetic resource-derived biotechnology because in the developing country's view transfer of such technology is the principal benefit derived from genetic resources to be shared under the Convention.

Transfer to developing country parties must be "under fair and most favourable terms," while providing for "adequate and effective protection of intellectual property rights."³⁰ A summarization of the convoluted language of Articles 15(7), 16, and 19, with a simplicity the negotiators probably did not intend, is:

- (1) Parties to the Convention must arrange for transfer of genetic resource-based biotechnology to other parties (as well as biodiversity-conservation technology).³¹
- (2) Transfer to developing countries technology must be on "fair and most favourable" terms—including "concessional and preferential terms where mutually agreed."³²
- (3) Parties must take measures "with the aim that" the private sector, as well as the public sector, facilitates transfer of both proprietary and non-proprietary technologies (referred to in (1)

28. For the sake of convenience, in this paper "technology transfer" is used as a shorthand to encompass references in the treaty (and elsewhere) to technology "cooperation" and to the "facilitation" of acquisition of technology, as well as uses of the term "transfer" itself.

29. *See id.*, arts. 16, 19. Provisions of these articles variously discuss technologies that "make use of genetic resources and do not cause significant harm to the environment," "biotechnologies based upon genetic resources provided by [convention parties]," and technologies that "make use of" genetic resources provided by parties. *See id.*

30. *Id.*, art. 16(2). To further complicate matters, Article 16(5) provides that parties shall "cooperate . . . in order to ensure that [patents and other intellectual property] rights are supportive of and do not run counter to [the Convention's] objectives."

31. *See id.*, arts. 15(7), 16.

32. *Id.*, art. 16(2).

above) to the private and public sectors of developing countries.³³

(4) Transfer of proprietary technology must "recognize and [be] consistent with the adequate and effective protection of intellectual property rights."³⁴ On the other hand, 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."³⁵

4. Definition and Scope

The range of activities subject to the provisions concerning the biodiversity trade is potentially very wide. Genetic resources are defined in the Convention to mean "genetic material of actual or potential value."³⁶ "Genetic material" is defined broadly in turn as "any material of plant, animal, microbial or other origin containing functional units of heredity."³⁷ Biotechnology is defined as "any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use."³⁸ Arguably, these terms cover everything from the application of the latest genetic engineering techniques to genetic material from the Brazilian rainforest in a multinational corporation's agricultural research labs to the planting of a new maize variety by an African peasant using traditional farming methods. On the other hand, a strict reading

33. *See id.*, art. 16(4). Other technology transfer provisions do not specify whether they cover private sector activities.

34. *Id.*, art. 16(2).

35. *Id.*, art. 16(5).

36. *Id.*, art. 2. "Value" is not defined, so it is unclear whether it signifies economic value alone. In favor of a broader interpretation is the preamble's affirmation of "the intrinsic value of biological diversity and . . . the ecological, genetic, social, economic scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components." *Id.* (Preamble, ¶ 1)

37. *Id.*, art. 2.

38. *Id.*

of the term "genetic resources" might exclude transactions involving the transfer of goods—such as biochemical extracts which are unlikely to contain "functional units of heredity"—from Article 15's access requirements.

II. A PRELIMINARY CRITIQUE OF THE BIOTECH/BIODIVERSITY DEBATE

If our ultimate natural resource is the solar flow of low entropy, then our ultimate capital is the gene pool in which evolution has evolved and stored technologies for tapping this basic flow for life generation In the future the industrial capitalist . . . may be replaced by a new privileged class that has managed to patent life itself and, through ownership of seed and breeding stock, to monopolize access to solar energy.³⁹

The biotech/biodiversity debate⁴⁰ is based on a number of empirical and logical assumptions, including assumptions about the future development of biotechnology and the impact of IPR on technological and economic development. This part reviews and critiques these assumptions before the discussion in Part III of future elaboration of the Convention's principles.

Part II.A reviews assumptions about biotechnology and its relationship to biodiversity, which assumptions, while unproven, underlie the basic principles of the Convention and must in some form underlie any proposed structure elaborating those principles. Part II.B reviews arguments on IPR and technology transfer and concludes that parties to the Convention should not take measures to modify IPR within the framework of the Convention until better evidence is available.

39. HERMAN E. DALY & JOHN B. COBB, JR., FOR THE COMMON GOOD: REDIRECTING THE ECONOMY TOWARD COMMUNITY, THE ENVIRONMENT, AND A SUSTAINABLE FUTURE 204 (1989).

40. See *supra* part I.A.

A. *The Technological and Economic Future of Biotechnology*

The vehement demands of the South for a share in biotechnology profits and the enthusiastic interest of many environmentalists in the distribution of the commercial benefits of biodiversity are predicated on four—more or less plausible but unproven—assumptions about the future of biotechnology. These assumptions are: (1) the economic value of biotechnology will grow rapidly to a very high level; (2) biodiversity will be a valuable “raw material” for biotechnology; (3) source countries of biodiversity will be able to capture a significant proportion of the total value of biotechnology through benefit-sharing or as compensation for the contribution of biodiversity to the final product; and (4) compensation or a share of the benefits will flow back to source countries so as to promote conservation of biodiversity.

1. *The Economic Potential of Biotechnology*

The first assumption is that biotechnology has great economic potential. Here, environmentalists, biotechnology boosters, and government officials from the North and South are united in anticipating revolutionary advances in the power of biotechnology. The U.S. biotechnology industry is growing very rapidly, with total 1992 sales of nearly \$5 billion, a 35% increase over 1991 sales totaling about \$4.4 billion.⁴¹ Some predict that sales will have increased by a factor of ten by the year 2000.⁴² Such facts suggest that the future power and value of biotechnology are indeed vast, although the timing, extent and nature of advances and their economic and social impact are extremely difficult to predict.⁴³

41. See G. STEVEN BURRILL & KENNETH B. LEE, JR., *BIOTECH 93: ACCELERATING COMMERCIALIZATION: AN INDUSTRY ANNUAL REPORT 1* (1992).

42. See INDUSTRIAL BIOTECHNOLOGY ASSOCIATION, U.S. BIOTECHNOLOGY INDUSTRY FACT SHEET (1992).

43. See, e.g., *Can Biotech Put Bread on Third World Tables?*, *BUS. WEEK*, Dec. 14, 1992; *Splicing Genes, Slicing Exports? U.S. Firms' Bio-Engineered Tropical Plants May Threaten Third World Farmers*, *WASH. POST*, Sept. 27, 1992, at H1; LAWRENCE BUSCH ET AL., *PLANTS, POWER, AND*

2. The Technological Value of Biodiversity for Biotechnology.

Second, it is assumed that biodiversity will have significant monetary value as a raw material for biotechnology. The extent to which this is true is uncertain and will depend on the nature of scientific and technological development. Historically, wild plants have been a valuable source of medicines, and, today, "one-fourth of all prescriptions dispensed in the United States contain active ingredients extracted from plants" while "[c]omponents derived from plants, microbes, and animals were involved in developing all of the twenty best-selling drugs in the United States, drugs whose combined sales approached \$6 billion in 1988."⁴⁴

Nevertheless, until recently, many experts in the pharmaceutical industry dismissed natural plants and animals as sources for new drugs, focusing instead on chemical research. While attitudes are changing, the relative contribution of biodiversity to the pharmaceutical sector remains to be seen. It has been estimated that there is only a 1 in 5,000 to 10,000 chance that a given chemical from a rainforest species sample screened for a particular medical use will reveal a promising lead to a commercial pharmaceutical.⁴⁵ Still, with the availability of inexpensive mass screening, large-scale sampling could lead to a significant number of profitable drugs.

On this point, it is important to clarify that genetic engineering using genetic resources is only part of biodiversity's value to technology. For instance, under the widely publicized 1991 "biodiversity prospecting" agreement between Merck Pharmaceuticals and INBio, the Costa Rican conservation organi-

PROFIT: SOCIAL, ECONOMIC, AND ETHICAL CONSEQUENCES OF THE NEW BIOTECHNOLOGIES (1991); RIFKIN, *supra* note 9.

44. See WORLD RESOURCES INSTITUTE ET AL., GLOBAL BIODIVERSITY STRATEGY 4 (1992).

45. See James McChesney, Biological Diversity, Chemical Diversity and the Search for New Pharmaceuticals (1992) (unpublished paper presented at the Rainforest Alliance Symposium on Tropical Forest Medical Resources and the Conservation of Biodiversity).

zation, INBio provides samples from diverse species of plants, animals and microorganisms found in Costa Rican rainforest to Merck, which analyzes them for substances with pharmacological properties.⁴⁶ If Merck develops and patents a pharmaceutical product that is refined from, or has a structure based on, a compound found in a sample, Merck will pay royalties to INBio on sales of the product. Merck will pay these royalties whether commercial quantities of the drug are obtained through harvesting of the sampled species, through industrial chemical synthesis, through culturing of tissue from the species, or through culturing of another organism into which genes from the species have been inserted through genetic engineering.⁴⁷ In agriculture, it has been estimated that "\$1 billion annually has been added to the value of U.S. agricultural output" by breeding of improved crop varieties in which traditional varieties of crops and their wild relatives have played an essential part.⁴⁸ This genetic diversity will almost certainly remain an essential source for the development of improved crop varieties through biotechnological as well as more traditional plant breeding methods.⁴⁹

Overall, there is little doubt that biodiversity from developing countries has contributed and will continue to contribute to the production of food, pharmaceuticals and other products worth many billions of dollars every year. It is difficult, however, to

46. See *U.S. Drug Firm Signs Up to Farm Tropical Forests*, WASH. POST, Sept. 21, 1991, at A3.

47. The Convention, however, defines the terms genetic resources and biotechnology broadly. Arguably, these definitions encompass activities under biodiversity prospecting agreements, including all of these hypothetical uses. See *supra* part I.B.

48. See WORLD RESOURCES INSTITUTE, *supra* note 44, at 5.

49. See, e.g., CARY FOWLER & PAT MOONEY, *SHATTERING: FOOD, POLITICS, AND THE LOSS OF GENETIC DIVERSITY* (1990); Miguel A. Altieri & Laura C. Merrick, *Agroecology and In Situ Conservation of Native Crop Diversity in the Third World*, in *BIODIVERSITY* 361 (E.O. Wilson ed., 1988); Mark J. Plotkin, *The Outlook for New Agricultural and Industrial Products from the Tropics* 106, 110, in *BIODIVERSITY*, *supra*; Hugh H. Iltis, *Serendipity in the Exploration of Biodiversity: What Good Are Weedy Tomatoes?*, in *BIODIVERSITY*, *supra*.

quantify the extent to which development of new products will depend on biodiversity.

3. Share of Value Available to Biodiversity Providers

A third assumption is that original possessors of biodiversity will be able to capture a significant proportion of its economic value as a raw material. One determining factor will be the nature of biodiversity and its use in biotechnology. It may be that biodiversity is so widely distributed that no single country or group of countries will be able to capture a significant share of profits. Many genetic resources are already available in *ex situ* collections, and smuggling of genetic resources may also be a problem. Furthermore, end-product profits may not often yield windfalls, leading one observer to suggest that "the chances are good that the total amount of royalties available to the developing world will be disappointingly small."⁵⁰

Another determining factor will be the future development of national and international legal and economic institutions and business practices. Domestically, biodiversity source countries are most likely to capture significant value through law and policy reforms, such as those described in Part III.⁵¹ Rationales for these measures are discussed in Part III. Internationally, approaches like those outlined in Part III will be necessary. Overall, given the uncertainties involved, it is possible to suggest approaches, such as those in Part III, for maximizing the value returned to biodiversity sources, but it is difficult to gauge the size of the potential economic benefits.⁵²

50. See Barton, *supra* note 22, at 776.

51. See *infra* part III.

52. See Walter V. Reid et al., *A New Lease on Life, in* BIODIVERSITY PROSPECTING: GUIDELINES FOR USING GENETIC AND BIOCHEMICAL RESOURCES SUSTAINABLY AND EQUITABLY (Walter V. Reid et al. eds., forthcoming 1993) [hereinafter BIODIVERSITY PROSPECTING].

4. Biodiversity Trade as a Conservation Incentive

Behind the environmentalist interest in biodiversity commercialization lies the assumption that if sources of biodiversity capture a significant proportion of the economic value they will be encouraged to conserve biodiversity as a result. This, also, will depend on future economic and political institutions and practices.

For instance, it is not enough merely to ensure that benefits return to source countries. Compensation for biodiversity use must flow back to the particular people who can and will conserve biodiversity if given the chance and the incentive. "Unless local communities have the incentives, the capacities and the latitude to manage biodiversity sustainably, national and international actions are unlikely to produce results."⁵³ This means that compensation must benefit and support local communities, conservation organizations, and government agencies, such as national park services or public lands managers.

Ensuring that compensation goes to the proper parties will require a range of reforms, including development and strengthening of institutions, such as environmental non-governmental organizations (NGOs), environmental agencies, local community-controlled governments, and community-managed trust funds for conservation. It will also require reforms: 1) that strengthen procedures for ensuring government accountability and protection of individual rights against both governmental and private misconduct; and 2) that strengthen institutions—such as independent judiciaries, prosecutors' offices, and the public interest bar—that manage and conduct such procedures. It will also require dealing with a host of difficult questions about distribution of benefits.⁵⁴

Biodiversity trade alone will not remedy biodiversity loss. This is true even if biodiversity proves highly valuable as a raw material for a revolutionary biotechnology, even if mechanisms are developed that ensure a substantial share of benefits go to devel-

53. WORLD RESOURCES INSTITUTE ET AL., *GLOBAL BIODIVERSITY STRATEGY: POLICY-MAKERS' GUIDE* 19 (1992).

54. *See infra* part III.

oping countries, and even if developing countries take measures to provide benefits to local people and better protect their interests as against opposing interests that benefit from logging, ranching and other uses that destroy habitat. Biodiversity trade must be coupled with other "extractive" uses—i.e. harvesting of resources without damaging the ecosystem—including harvesting of nuts, fruits, other foods, medicinal herbs for local or regional use, and other products such as rubber or chicle.⁵⁵ It will also be necessary to reform national and international economic systems to fully incorporate ecological values of natural habitats, such as watershed regulation or soil stabilization, as well as economic values in local or subsistence economies.⁵⁶ Even with all these changes, compensation for use of genetic resources as well as other extractive uses of biodiversity will probably only be part of an array of approaches to biodiversity protection.⁵⁷ Thus, future talks on the Convention should balance economic factors with other equally important facets of biodiversity protection.

B. The Relevance of Technology Transfer and Intellectual Property

The Convention emphasizes transfer of biotechnology derived from genetic resources while providing also for transfer of biodiversity protection technology. The lack of emphasis on biodiversity protection technology is reasonable given that the root causes of biodiversity loss—in contrast to environmental problems covered by other international agreements, such as ozone depletion—have much more to do with systemic political and economic factors than with replacement or improvement of technology.⁵⁸ One rationale for transfer of biodiversity-derived technologies is that those who possess and control natural resources

55. See generally *SUSTAINABLE HARVEST AND MARKETING OF RAIN FOREST PRODUCTS* (Mark Plotkin & Lisa Famolare eds., 1992).

56. See *WORLD CONSERVATION MONITORING CENTRE, GLOBAL BIODIVERSITY: STATUS OF THE EARTH'S LIVING RESOURCES 5* (1992).

57. See *id.*

58. See, e.g., *WORLD RESOURCES INSTITUTE, supra* note 44.

are more likely to cherish and conserve them if they receive a significant portion of the economic benefits of their use.⁵⁹

With regard to biodiversity-protection technologies, a preliminary question is, what if any technologies are relevant to biodiversity protection? There are some technologies, such as computer-based geographic information systems and satellite-based or aircraft-based remote sensing, that are highly relevant to monitoring of biodiversity and threats to it. These technologies are sometimes protected by IPR. Often, however, private firms, government agencies and conservation organizations that have developed such technologies are willing to waive IPR when providing the technologies or their results. Ultimately, while these technologies are expensive—and IPR can contribute to the cost—they form a relatively small part of the program of reforms and other measures needed to stem biodiversity loss.

Turning back to genetic resources-based biotechnology, it is unclear that cutting-edge biotechnologies developed in industrialized countries are what developing countries most need for their development. Even in the pharmaceutical and agriculture sectors, many, if not most, useful products and processes are in the public domain; the latest biotechnology products developed in industrialized countries are unlikely to address key needs of the developing world. Indeed, much of the technology needed for rural development and biodiversity conservation is not only non-proprietary but indigenous.⁶⁰ Little has been done to identify specific biotechnology products or processes that are needed for sustainable development in the developing world. In light of this, developing countries will probably find it most useful to explore how the Convention's technology transfer provisions can encourage

59. Other rationales commonly offered for technology transfer requirements are that developed countries should pay developing countries' costs of dealing with global environmental problems because: (1) developed countries contributed more to the problems; (2) developed countries have an obligation to help developing countries improve their technological development as compensation for economic exploitation during the colonial era; and (3) developed countries are different from developing countries in that they have more money.

60. See REID, *supra* note 10, at 9, 12, 19.

biotechnological use of their genetic resources that truly benefits them. For instance by supporting measures to increase in-country capacity for research and development rather than measures to gain special privileges for access to the latest biotechnology products from industrialized countries—products that may be of limited utility in poorer countries.⁶¹

For both types of technology transfer, it is questionable whether IPR is as great an obstacle to technology transfer as is claimed. Oddly enough, given the vehemence of the debate on IPR, the empirical evidence of its effects on technology transfer is scanty and inconclusive.⁶² Proponents of strong intellectual property rights claim that they are essential to development of advanced technology in any country, and, at the same time, these proponents complain that weak IPR regimes in developing countries unfairly deprive Northern-based industries of billions of dollars of profits per year.⁶³ There is little solid quantitative data to support these claims, but they motivate the hard line that the U.S. takes in international negotiations on trade as well as biodiversity.

On the other hand, developing countries argue that strong intellectual property rights impede technology diffusion and can interfere with other policy goals in developing countries, such as provision of affordable health care. But here, too, there is little hard evidence as to the actual cost of obtaining needed proprietary technologies.⁶⁴ Some commentators have suggested that

61. Some possible mechanisms are discussed in Part III, *infra*.

62. See *Strengthening Protection of Intellectual Property Rights in Developing Countries* (Wolfgang E. Siebek, ed.), in *WORLD BANK DISCUSSION PAPER NO. 112* (1990); M. BLAKENEY, *LEGAL ASPECTS OF THE TRANSFER OF TECHNOLOGY TO DEVELOPING COUNTRIES* 53-57 (1989).

63. See, e.g., Robert M. Sherwood, *Why a Uniform Intellectual Property System Makes Sense for the World* (unpublished paper presented at the National Research Council's conference on global dimensions of intellectual property in science and technology, Wash., D.C., Jan. 8-9, 1991); U.S. INTERNATIONAL TRADE COMMISSION, *FOREIGN PROTECTION OF INTELLECTUAL PROPERTY RIGHTS AND THE EFFECT ON U.S. INDUSTRY AND TRADE* (1988) (USITC Publication No. 2065).

64. A rare attempt at numerical calculation, focusing on commercial crop varieties, arrives at a very rough estimate that plant breeders' proprietary

strong IPR protection also contributes to erosion of crop genetic diversity, but the evidence is inconclusive.

Some studies suggest that IPR is in fact of little relevance to much technology transfer. While some industries, such as pharmaceuticals, value patent protection very highly, many industries do not rate it as very important.⁶⁵ Studies of the transfer of environmentally sound technology suggest that intellectual property is a relatively minor issue.⁶⁶ For instance, many of the best available technologies for addressing climate change through greenhouse gas emission reductions are in the public domain.⁶⁷ Similarly, some technologies that can substitute for CFC-based technologies were invented decades ago and are no longer covered by intellectual property rights.⁶⁸

rights over improved crop varieties originating in developed countries cost buyers in developing countries \$100 million a year, assuming a total developing-world seed market of \$10 billion per year. See Barton & Christensen, *supra* note 11, at 344.

65. See Levin et al., *Appropriating the Returns from Industrial Research and Development*, in 3 BROOKINGS PAPERS ON ECONOMIC ACTIVITY 783 (1988). Lead time in developing and marketing technology and in assimilating new technological information were ranked as the most significant variables. In addition, businesses can work around weaknesses in IPR regimes by selecting reliable partners in developing countries and developing "carefully structured technology transfer arrangements." J. ERSTLING, PROTECTION AND MANAGEMENT OF INTELLECTUAL PROPERTY 17-18 (1991) (study prepared for US AID).

66. For example, a comprehensive 1991 study on greenhouse gas emission reduction technology, which the United Kingdom commissioned for the United Nations Conference on Environment and Development (UNCED), concludes that "intellectual property rights are not in practice a significant barrier to the transfer of [environmentally sound technology] to developing countries." TOUCHE-ROSS & COMPANY, GLOBAL CLIMATE CHANGE: THE ROLE OF TECHNOLOGY TRANSFER 73 (1991); see ERSTLING, *supra* note 65, at 26, 47.

67. See TOUCHE-ROSS, *supra* note 66, at 26, 73. On the other hand, as populations increase and development advances, innovative technology will be needed to meet increasingly stringent limits on emissions per unit of production. In most industrialized countries, this technology will be protected by IPR, at least if it is developed by the private sector.

68. See, e.g., UNITED NATIONS ENVIRONMENTAL PROGRAMME, TECHNICAL PROGRESS ON PROTECTING THE OZONE LAYER xiii, at 5 (1989) (report pursuant to art. 6 of the Montreal Protocol).

In sum, it is unclear whether IPR has the prominence in real life that it has in diplomatic talks. Arguably, other factors, such as the indigenous institutional capacities to absorb and use new technologies, are considerably more important. Parties to the Convention should cooperate on further study of the relevance of IPR and other factors to the transfer of genetic resources-derived technology and its use in sustainable development. By sidelining IPR discussions for the moment until facts and logic can be injected into the debate, these parties can begin negotiating concrete measures to manage the biodiversity trade equitably and sustainably.

III. POSSIBLE NEXT STEPS FOR THE BIODIVERSITY CONVENTION

As the value of biological resources and genetic materials important in biotechnology increases, source countries will establish rules governing access to ensure conservation and to provide benefits to their own economies when those resources are the basis for valuable products. . . . It is neither surprising nor novel that countries that own the resources used in research desire some benefit from the final product or a chance to have special licensing arrangements within their own borders. . . .

. . . .
. . . [T]he most effective way to ensure sustainable use of genetic resources while enhancing conservation efforts is by establishing international agreements that set standards to which all parties can be held accountable.⁶⁹

The Convention will enter into force ninety days after thirty countries have ratified it.⁷⁰ As of May 28, 1993, nineteen countries had ratified the Convention, among them Canada, China and Mexico.⁷¹ On June 4, 1993, the United States signed the

69. Albert Gore Jr., *Essentials for Economic Progress: Protect Biodiversity and Intellectual Property Rights*, 4 J. NIH RES. 18, 19 (1992).

70. Convention, *supra* note 1, art. 36(1).

71. See *United Nations Environmental Programme*, *supra* note 2.

treaty.⁷² The first major inter-governmental meeting on the Convention is scheduled for October 11-15, 1993 in Geneva and will be held whether or not the Convention has entered into force. Negotiations at this meeting—which will cover financing of implementation and other issues—will lead into the periodic Conferences of the Parties that will be held after entry into force. In these Conferences of the Parties, countries will monitor implementation, administration, and financing and possibly negotiate protocols (related but separate treaties) and amendments to the Convention.⁷³

How should negotiators proceed? The analysis in Part II points in two general directions. First, countries should arrange for further study of intractable issues, such as IPR protection as well as deeper questions regarding the social, economic and environmental effects of IPR over living beings. Having done so, they should avoid using the Convention as a forum to argue either for strengthened IPR or restrictions on IPR until there is better evidence on the effects of IPR on conservation and sustainable use. Second, they should negotiate toward specific measures to implement the Convention's basic principles for managing the biodiversity trade—including compensation for use of biodiversity, mutual agreement on access to genetic resources and biotechnology transfer. The specific application of the Convention's general principles of equitable distribution and incentives to conservation to these activities is an urgent task, as transnational corporations, as well as government-funded researchers, are moving to explore the commercial potential of biodiversity through biodiversity prospecting transactions and biotechnological exploitation of plant genetic resources and traditional plant breeding methods.⁷⁴

As the brief critique in Part II makes evident, developing specific measures will require legal, economic and social research and analysis. For example, how can we establish a measure of biodiversity's worth as an input for biotechnology? What are

72. *See id.*

73. *See* Convention, *supra* note 1, art. 23. The first Conference of the Parties shall be convened within a year after entry into force. *See id.*

74. *See* Reid, *supra* note 52, at 6-14.

some structures for distributing benefits equitably and in a way that encourages conservation? What is the concrete effect of biotechnology IPR on biodiversity and sustainable development in the developing world? Convention parties should establish institutions within the Convention structure that can continue to assess these policy issues, as explained below, through an open deliberative process that includes all effected interests, especially the traditional custodians and owners of biodiversity who often depend on it for economic and cultural survival. Part III.F also briefly reviews the need for action by other international institutions, governments, and NGOs.

A. Minimum Standards for Transactions in the Biodiversity Trade

In light of the growing importance of the biodiversity trade, a number of countries are seeking to regulate the collection and export of biodiversity, including genetic resources, in order to maximize the benefits accruing within their jurisdiction and to ensure sustainable use.⁷⁵ The Convention can serve as the framework for the development of minimum standards for national regulation of these transactions. Initially, parties could establish such standards through a resolution of the Conference of the Parties declaring that they represent the minimum standard for implementation. They could later be adopted as a legally binding protocol.

1. Basis in the Convention for Development of Minimum Standards

A central theme of the Convention is the commercial transfer and use of genetic resources at the international level. Articles 8(j), 15, 16, and 19 of the Convention establish basic principles

75. For instance, leaders of seven Central American countries have declared their intent to coordinate passage of legislation regulating research on their countries' biological diversity that results in the development of commercial products. See *Central American Presidents Resolve To Pass Laws Restricting Use of Resources*, 15 Int'l Env'tl. Rptr. (BNA) 397 (Jun. 17, 1992).

for this biodiversity trade, providing that it shall proceed on mutually agreed terms, with prior informed consent of countries of origin, sharing of benefits from the use of the genetic resources with source countries, and sharing of benefits derived from the application of traditional knowledge of sustainable use of biodiversity with the holders of the knowledge.⁷⁶ Because the Convention defines genetic resources and biotechnology very broadly, these biodiversity trade provisions could encompass a wide range of transactions involving nearly any technological use of any organisms that capitalizes on their diversity, whether or not genetic engineering is among the specific applications contemplated.⁷⁷

The provisions of these articles indicate that the Convention is the international forum for regulation of the biodiversity trade. There is ample precedent for the use of specific agreements to deal with commerce in certain products.⁷⁸ The Convention on International Trade in Endangered Species of Wild Fauna and Flora ("CITES") is a prime example of a treaty designed to ensure conservation through control of trade.⁷⁹ The measures suggested below to articulate this purpose of Convention are consistent with requirements of international trade agreements.⁸⁰ They do not contemplate export or import restrictions, discrimination among trading partners, or discrimination between domestic and

76. See *supra* part II.B.

77. See *id.*

78. Examples include the International Tropical Timber Agreement, the International Coffee Agreement, and the International Wheat Agreement.

79. *Done* Mar. 3, 1973, 27 U.S.T. 1087, 12 I.L.M. 1085 [hereinafter CITES].

80. Article 22 provides that the Convention's provisions "shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement, except where the exercise of those rights and obligations would cause . . . serious damage or [a] threat to biological diversity." Convention, *supra* note 1, art. 22. Thus, unless the requirements of an earlier trade agreement demonstrably threatened biodiversity, they would prevail over inconsistent provisions of the biodiversity treaty. Of course, a protocol to the Convention would not necessarily be limited by this provision. In addition, any agreement coming out of the Uruguay Round is likely to enter into force after the Convention does, so its relationship with the Convention would be governed by international law of treaties rather than Article 22.

foreign traders.⁸¹ More problematic would be measures for enforcing biodiversity trade regulations through trade sanctions against non-parties⁸² or against parties violating the regulations.⁸³

The provisions in Article 15(2) that require parties to facilitate access to genetic resources specify that they must facilitate access to "*other Contracting Parties*," leaving unclear whether the private sector within another party's jurisdiction is entitled to access.⁸⁴ The surrounding text, which speaks of commercial utilization, suggests that negotiators probably intended the private sector to be included as agents or components of a country. In any case, the Convention's underlying rationale argues for apply-

81. The "most-favored-nation" principle of Article I of GATT forbids parties from discriminating among imports by national origin, or from discriminating among exports according to the nation to which they are bound. *See* GATT, *supra* note 15. The right of "national treatment" under Article III obligates a party to treat foreign and domestic exporters equally. *See id.* Article XI of GATT forbids quantitative restrictions on exports or imports, such as quotas or bans. *See id.*

82. Against non-parties that are parties of GATT, sanctions by a party that is also a GATT party might not be permissible under international law. *See* Vienna Convention on the Law of Treaties, May 23, 1969, art. 30, 1155 U.N.T.S. 331, 8 I.L.M. 679 ("[w]hen the parties to the later treaty do not include all the parties to the earlier one . . . as between a State party to both treaties and a State party to only one of the treaties, the treaty to which both States are parties governs their mutual rights and obligations"); *see also* Housman & Zaelke, *supra* note 15, at 579 (discussing analogous provisions of the Montreal Protocol on Substances That Deplete the Ozone Layer).

83. There is considerable support within the environmental community for enforcement of international environmental agreements through trade measures. *See* Housman & Zaelke, *supra* note 15, at 608-09. Usually, however, the sanctions—such as the bans on trafficking in CFC's under the Montreal Protocol or the bans on trafficking in endangered wildlife under CITES—are intended to combat environmental problems directly. A ban on access to genetic resources, on the other hand, would be a punitive measure that does not in itself promote conservation. Indeed, the theory purportedly underlying the Convention—that biotechnological use of biodiversity creates economic incentives to sustainably use it—justifies more, not less, trade in genetic resources. Moreover, the use of any trade measures in any form in international environmental agreements continues to be a serious point of contention at the international level.

84. Convention, *supra* note 1, art. 15(2) (emphasis added).

ing standards to transactions involving the private sector since that is where the real money will be, if it is available. Thus, developing countries have an incentive to apply such standards to the private as well as the public sector.

2. Rationale for Multilateral Minimum Standards

Uniform international guidelines will be important for several reasons. First, they will allow parties to pool their expertise to draft and negotiate comprehensive rules drawing on the best available knowledge and advice. Developing countries, especially smaller ones, should find it particularly useful to draw on an international pool of expertise in a public negotiating process that reveals the viewpoints and interests of advisors and delegates. Of course, standards must make allowances for differences among nations in cultures, legal systems, and other conditions. Another advantage of the negotiation of uniform rules is that countries will be able to anticipate disagreements as they consider both importing and exporting countries' viewpoints; the full range of interest groups from indigenous peoples' organizations to multinational pharmaceutical corporations can be brought into an open discussion. Uniform rules will also reduce administrative costs to importing firms and collectors working in more than one country because basic requirements will be constant from country to country and will be established from a central and relatively accessible location—the Convention secretariat.

Failure to achieve uniformity could lead to a plethora of inconsistent unilateral requirements that would discourage business and make it difficult to monitor and ensure compliance with the Convention. Perhaps most important, minimum international standards will help individual countries resist pressure to allow access on less favorable terms.

3. Content of Minimum Standards

Minimum standards should cover transactions involving both the public and private sector. The following elements are pro-

posed for inclusion in standards.⁸⁵ These are tentative recommendations because any standards must be based on input from local people who are the traditional stewards and owners of the resources in question.

a. Specific requirements for "prior informed consent." There should be standards for consent of both parties and affected indigenous or traditional knowledge-holders whose knowledge is used.⁸⁶

b. Environmental regulation. Standards should require that collecting and harvesting of plants and other biota is sustainable through conservation regulations and, if appropriate, assessment and audits of the environmental impact of biodiversity exploitation. Environmental standards should incorporate but go beyond CITES requirements.

c. Prior informed consent. Prior informed consent of landowners and peoples indigenous to territories where samples are to be taken should be obtained.⁸⁷

d. Informed consent and equitable distribution of benefits. Informed consent should be obtained from local people and in-

85. In developing standards, drafters can find analogies and precedent in the FAO Draft International Code of Conduct for Plant Germplasm Collecting and Transfer (FAO Doc. No. CPGR/91/10), scientific codes of ethics, plant conservation laws (for guidance on regulating impact of collecting and harvesting), oil and gas lease auction guidelines, as well as relevant legal scholarship. For detailed discussion of possible measures for regulation and monitoring of international genetic resources agreements, see Eric Christensen, *Note, Genetic Ark: A Proposal to Preserve Genetic Diversity for Future Generations*, 40 STAN. L. REV. 279 (1987).

86. See Convention, *supra* note 1, arts. 8(j), 15. For a discussion of Article 8(j), see *supra* notes 26-27.

87. Strictly speaking the Convention requires prior approval of indigenous or local people only when traditional knowledge or practices are applied more widely under Article 8(j), but prior informed consent of locals to collecting is an important aspect of implementation of Articles 8(c) and 11. See note 88, *infra*.

digenous peoples before entering to collect biodiversity, and benefits should be shared with local communities, including indigenous peoples, and possibly environmental NGOs.⁸⁸

e. Public participation and disclosure for transactions involving public lands or waters. The public should have access to both negotiations on terms of access and public disclosure of the effects and results of performance (excluding trade secrets) where transactions involve genetic resources on public lands or in public waters.⁸⁹

f. Technology transfer. At the option of the source country, there should be a requirement that part of the compensation be in the form of technology transfer, whether proprietary or non-proprietary, with the parties mutually agreeing on measures for protecting IPR.⁹⁰

*g. Compensation terms.*⁹¹ Establishing a minimum for total compensation or setting a minimum royalty rate would

88. Providing for local benefits implements both Article 8(c), which requires parties "as far as possible and as appropriate [to] [r]egulate . . . biological resources . . . with a view to ensuring their conservation and sustainable use," as well as Article 11, which requires parties "as far as possible and as appropriate [to] adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of . . . biological diversity," and Article 8(j). Convention, *supra* note 1, arts. 8(c), 11.

89. Conservation is best promoted if rights to extract resources from public lands are distributed through public auctions designed to guard against corruption and ensure market-based rates of return to the government.

90. For instance, standards could require that a contract provide for such transfer by giving entities in the source country a right of first refusal, or access to multilateral financing, for licensing of patents related to the transaction where the patented products were well-suited to the social and technological needs in the source country. This would promote the technology-sharing purposes of the Convention without creating concerns among IPR holders that they might be subjected to compulsory licensing.

91. This article uses the term "compensation" in preference to the term "benefits sharing" employed in the Convention because, as explained in Part

probably not be useful since rates will depend on market-based assessments of risk and potential payoffs, which are preliminary and will probably vary widely in this nascent market. But the guidelines might require some minimum initial payment and payment for samples delivered (in proportion to the quantities called for by the contract) in order to provide immediate incentives to conservation.⁹²

h. Simplified standards for scientific research. It will be extremely important to ensure that standards do not impose requirements that discourage scientific research not directly aimed at commercialization. Our ecological and taxonomical ignorance is vast, and more scientific research is desperately needed not only for conservation but also to increase the value that biodiversity-rich countries can obtain from sustainable use of their biodiversity. Through collaborative projects, scientific research by foreigners can also contribute to training of domestic scientists and strengthening of in-country infrastructure. Thus, procedures should be simplified, and costs reduced—for instance, no up-front payment should be required—for collection and export of samples of biodiversity carried out by public sector scientific researchers.⁹³

There will probably be cases where scientists working in the public sector collect biodiversity, and commercial applications are developed by third parties, “several intellectual generations away from the raw genetic material.”⁹⁴ It will be a challenge to devise a procedure or agreement that ensures the return of benefits to the source without imposing such complex monitoring and reporting obligations that it discourages pure research.

II.B, *supra*, the former implies payment for value received through mutual agreement, while the latter hints at largesse.

92. To avoid discouraging interest from potential buyers, guidelines should probably permit them to require that most of the initial payment be devoted to establishing the infrastructure that the in-country partner needs to carry out collecting and other agreed-upon activities.

93. See Barton, *supra* note 22, at 775-76.

94. Letter from John H. Barton, Stanford Law School, to Walter V. Reid, World Resources Institute (Jan. 5, 1993) (copy on file with author).

i. Permitting systems. Standards should provide for a uniform system of permitting, like the one established under CITES, in which exporting countries issue permits in standard forms recognizable to authorities of all importing countries.⁹⁵ These permits will evidence informed consent and should be issued only upon a finding that minimum standards have been met. Guidelines should require each country to designate authorities responsible for permitting, analogous to the management and scientific authorities under CITES. Permits issued by exporting and importing countries could certify that the relevant requirements were satisfied. Countries should allow for negotiation of blanket agreements that waive or modify certain permitting requirements for certain categories of transactions or activities, such as public-sector scientific research.

j. Public reporting and monitoring of compliance. The standards should provide for monitoring of compliance through publication of periodic reports on performance submitted by parties. Those reports should be as simple and brief as possible to avoid too heavy a burden on developing countries. The Convention Secretariat should also report periodically on performance and should accept and report on evidence from NGOs. This information will be essential for evaluating the contribution of the biodiversity trade to conservation and sustainable use.

B. Other Multilateral Standards for Parties to the Convention

Individual contracts for compensation for use of biodiversity are significant but are not the only route to creating economic returns to support biodiversity conservation. In addition to contract guidelines, parties could consider the following steps.

95. See CITES, *supra* note 79, art. III, para. 2, art. IV, para. 2, art. V, para. 2, art. VI.

1. Standards for Transfers of Previously Collected Genetic Resources

Convention parties should reexamine the treatment of genetic resources already collected in gene and seed banks.⁹⁶ Equity and conservation rationales both suggest that these resources should be subject to some version of the informed-consent and benefit-sharing principles. On the other hand, it would be impractical to subject genetic resources collected before the Convention entered into force to retroactive application of the same guidelines devised for future biodiversity trade. The treatment of genebank and collections could be covered as part of a future protocol to the Convention dealing with the biodiversity trade.

2. Standards for Protection of Traditional Knowledge

Parties to the Convention should consider establishing minimum standards for national intellectual property laws that require recognition of intellectual property rights for indigenous peoples and other preservers and holders of traditional knowledge about the valuable qualities of biodiversity. Admittedly, application of this principle will be highly complex,⁹⁷ but that does not distinguish it from many existing IPR regimes.

One possible specific measure would require applicants for patents or plant breeders rights to demonstrate that any genetic or biological resources or traditional knowledge on which the invention or plant variety is based was obtained (if obtained after the Convention enters into force) with the prior informed consent of the country of origin and the traditional custodians of the re-

96. See discussion *supra* notes 23-24.

97. Questions abound. For instance, who has the right to reveal traditional knowledge and to share in the profits from its commercialization? Does compensation flow to the individuals within the indigenous group who have the traditional duty to learn and pass on the knowledge? To the community as a whole? To the entire people or only the particular village involved? What if other indigenous peoples also have similar knowledge of the same plant or animal? Should they share in the benefits? What is the role of the government, in particular agencies commonly found in Western Hemisphere nations that purport to assist and protect indigenous peoples?

sources or holders of the traditional knowledge (at least where the associated traditional use was sustainable).⁹⁸ Such a requirement would help implement the Convention's directive that genetic resources be obtained on mutually agreed terms and that those capitalizing on traditional knowledge of sustainable use do so with the approval of the traditional holders of that knowledge.⁹⁹

Stronger measures could also be required so that providers of traditional knowledge were guaranteed a share of benefits, either through some type of IPR or another mechanism. In declarations made upon adoption of the text of the Convention, the governments of Colombia and Peru both argued that Article 8(j) should require governments to ensure, not merely "encourage," equitable distribution of benefits, and Colombia proposed that a future protocol should provide for this.¹⁰⁰

3. Standards for Property Rights in Biological Information

The calls from developing countries for compensation for commercial use of biodiversity transferred in the past rest on the assumption that the source countries have a property right in that biodiversity, just as they do in any other natural resource. This property differs fundamentally from other resources, such as oil or timber, in that it is "non-exclusive," that is, its value can be extracted without depleting the resource. What is valuable about biodiversity is not the material itself but the structure or information that organizes the material.

Thus, there have been calls for the recognition of property rights—which could be held by governments, landowners, tradi-

98. A number of U.S. NGOs recently proposed such measures to the U.S. Administration. See Facsimile Letter from Center for Development of International Law, CIEL, Center for Marine Conservation, Defenders of Wildlife, Environmental Defense Fund, National Audubon Society, National Wildlife Federation, Sierra Club, Western Ancient Forest Campaign, and The Wilderness Society to Ms. Katie McGinty, Director, White House Office on Environmental Policy (April 16, 1993) (copy on file with CIEL) [hereinafter McGinty Letter].

99. See Convention, *supra* note 1, arts. 8(j), 15.

100. See Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity, Nairobi Final Act, May 22, 1992, at 17, 23.

tional communities or indigenous peoples—in the biological information found in biodiversity, i.e. “bioproperty rights,” analogous in some ways to intellectual property rights over inventions or artistic creations and analogous in other ways to property rights over natural resources.¹⁰¹ While the creation of such property rights poses complex administrative problems,¹⁰² it offers the potential for superior economic incentives to conservation.¹⁰³ With the expansion of patent rights in the U.S. to cover living things and genetic material similar and even identical to what is found in nature,¹⁰⁴ there are strong equitable arguments

101. A detailed proposal to privatize “biological information” found in nature is laid out in JOSEPH H. VOGEL, *PRIVATISATION AS A CONSERVATION POLICY: A MARKET SOLUTION TO THE MASS EXTINCTION CRISIS* (1992) (published by Centre for International Research on Communication and Information Technologies (Melbourne, Australia) & Nucleo de Estudos e Pesquisas do Meio Ambiente (Vicosia, Brasil)). Also, see Roger A. Sedjo, *Property Rights for Plants*, *RESOURCES*, no. 97, Fall 1989, at 1.

102. See Barton & Christensen, *supra* note 11, at 350. For instance, what does it mean to say that the providers of a traditional crop variety—developed by “anonymous farmers” thousands of years ago, and maintained by their descendants and their descendants’ neighbors since then—deserve a share of the profits from commercial exploitation? See Shand, *supra* note 6, at 133. Who has the right to compensation? The individual farmer or community from whose field the source variety was collected? The traditional society or tribe to which they belong? The government of the country in which they are situated? The owner of the land (whether indigenous, traditional or other) where the source variety was found? All landowners on whose land the variety grows? How large a share of the profits is sufficient?

103. In the ideal scheme, benefits return to the specific rights holder with the power to maintain the component of biodiversity and any associated components. See Barton & Christensen, *supra* note 11, at 351-52; see also VOGEL, *supra* note 101.

104. United States courts and agencies have recognized the right of inventors to acquire patent rights over technologically modified living organisms since 1980. See *Diamond v. Chakrabarty*, 477 U.S. 303 (1980) (approving patenting of microorganisms); *Ex parte Allen*, 2 U.S.P.Q.2d 1425 (PTO Bd.App. & Int. 1987) (approving patenting of animals); *Ex parte Hibberd*, 227 U.S.P.Q. 443 (PTO Bd.App. & Int. 1985) (patenting of plants). Patents have been granted on highly purified natural compounds, and applications have been filed for patents on sequences of the human genome. See John H. Barton, *Adapting the Intellectual Property System to New Technologies* (unpublished paper prepared for presentation at the NRC’s

for extending analogous property rights to owners or caretakers of living things or to discoverers of species later found to contain valuable substances or genes.¹⁰⁵

C. Establishing Offices Under the Convention Secretariat

1. Biodiversity Trade Assistance Office

The parties should establish, under the auspices of the biodiversity convention secretariat, a Biodiversity Trade Assistance Office that would serve as an information clearinghouse and network and offer legal and technical assistance to developing-country governments and firms on implementing biodiversity trade standards, as well as offering such assistance on biodiversity prospecting and genetic resources contracts generally.¹⁰⁶ The office should also offer legal and technical assistance—possibly including the drafting of model legislation—to governments developing national regulations as well as to governments seeking to develop institutions that can best engage in sustainable exploitation of biodiversity.¹⁰⁷ Of course, this office must be intimately involved in both the development of international guidelines for biodiversity trade and in the Working Group on Biodiversity

Conference on Intellectual Property Rights in the Global Arena of Science and Technology, Wash., D.C., Jan. 8-9, 1992).

105. So far, however, U.S. law seems to favor corporate control more than the rights of individuals. In the leading case on this issue, a large institution retained intellectual property rights over cell lines derived from an individual's body part, while the court refused to recognize that the individual himself had property rights in those same cells cultured from his own spleen. *See Moore v. The Regents of the Univ. of California*, 793 P.2d 479 (1990); *see also* KIMBRELL, *supra* note 8, at 210.

106. *See* McGinty Letter, *supra* note 98.

107. In addition to adequate regulation of transactions, the institutional strength and commitment of the party in the biodiversity-rich country will be a major factor in determining the extent to which the transaction survives over time and promotes equitable sharing of benefits. The office could facilitate sharing of information between countries, such as Costa Rica, that have experience in establishing such institutions and other countries that are interested in creating similar institutions.

Trade that examines alternative measures, and the office must work closely with interested governments, inter-governmental organizations (IGOs), and NGOs.

2. Working Group on Biodiversity Trade

The parties to the Convention should establish a Working Group on Biodiversity Trade to study whether other measures¹⁰⁸ in addition to contract guidelines should be adopted.¹⁰⁹ Whether compensation is collected through contracts, property rights, or trusts funded by surcharges, the question of how to distribute compensation among governments, public and private groups and institutions, and individuals, is a complex one that needs more analysis.¹¹⁰ These measures should be compared to more radical alternatives, such as reinstating the application of the common heritage doctrine to genetic resources, limiting or banning commercial trade, or restricting life patenting or otherwise modifying conventional IPR.

The Working Group should develop preliminary recommendations for regulatory measures and topics needing long-term study for presentation at the first Conference of the Parties, which will probably be in 1994. While drawn from all regions, relevant government agencies, and inter-governmental and non-governmental organizations, members of the Working Group should serve in their own capacity and not as representatives of nations or IGOs and should be drawn not only from experts in the field

108. *See supra* part III.B.

109. For legal and policy analysis of relevant issues in the context of biodiversity prospecting, see BIODIVERSITY PROSPECTING, *supra* note 52.

110. For instance, what is the best mechanism for ensuring that benefit-sharing really contributes to conservation? If payment is made to the traditional holder of a traditional crop variety for instance, how will that payment ensure that the holder continues to conserve the variety? Should it be made in the form of a tax credit or government subsidy conditioned on the holder maintaining stocks of the variety? What other measures are needed to complement such an approach? For instance, subsidies or tax credits will do little good if competing subsidies for artificial fertilizer and pesticides, or for introduced commercial hybrid varieties, encourage farmers to stop using traditional varieties.

(including scientific and legal professionals) but from affected interests, including indigenous peoples, environmental NGOs, and industry. Most essential is that the people who have traditionally maintained, developed and depended on biodiversity for their livelihoods and cultural identity participate in this discussion.

3. Contract Supervising Authority

Parties should consider establishing an international authority to supervise negotiation and performance of biodiversity trade agreements under the Convention secretariat. This authority could monitor compliance with minimum standards in negotiation and performance, serve as a depository for contracts (with confidential portions under seal), and mediate or arbitrate disputes arising under such agreements.¹¹¹

4. Multilateral Trust Fund

Parties could consider establishing an international trust fund, possibly under the biodiversity convention secretariat. This trust fund would receive and distribute compensation, possibly consisting of a fixed small surcharge on profits from any biotechnological product derived from genetic resources.¹¹²

D. Technology Transfer

The discussion in Part II.B (above) suggests that many developing countries may wish to emphasize more multilateral support of mechanisms for cooperation on technology—whether or not it is

111. For a detailed proposal for such an international authority, see Christensen, *supra* note 85.

112. For discussion of possibilities for the structure and operation of such a fund, see KEYSTONE CENTER, *supra* note 23; CPL SCIENTIFIC LTD., POSSIBLE FUNDING MECHANISMS FOR A CONVENTION ON BIOLOGICAL DIVERSITY (1990) (study prepared for the World Wide Fund for Nature); IUCN, Draft Articles Prepared by IUCN for Inclusion in a Proposed Convention on the Conservation of Biological Diversity and for the Establishment of a Fund for That Purpose (1989); Barton & Christensen, *supra* note 11.

in the public domain—and to ensure that such mechanisms include information networks and clearinghouses and technical and legal assistance in transactions. Guidelines for funding should require inclusion of in-country training and infrastructure-building in all projects. A key criterion for any project should be that the technology is appropriate in light of cultural, economic, technological and social conditions in the destination country. Of course, where it is truly necessary to transfer a proprietary technology, technology transfer mechanisms must provide for financing of the cost of IPR or take other measures to ensure transfer.¹¹³

To encourage technology transfer, it appears advisable for developing countries to adopt domestic policies to improve conditions across the board for scientific research and technological development, including: (1) support for training and improved infrastructure; (2) greater freedom of information internally and access to information from abroad; and (3) research and development aimed at adaptation of acquired technologies to local conditions.¹¹⁴ As this suggests, building in-country capacity requires a broad approach that goes beyond a narrow focus on the biotechnology sector and ultimately involves building the institutions needed for a stable and open civil society. For instance, one thing that INBio could offer Merck was the stability of INBio and the stability of Costa Rica's political and legal system: this gave Merck security that it could count on reliable supplies as needed during research and development over the years to come.

Similarly, the most promising strategy for many biodiversity-rich countries seeking to maximize benefits from biodiversity is

113. Financing of patent licensing costs is explicitly included among the incremental costs to be covered through funding from the Montreal Protocol Multilateral Fund, which finances transfer of chlorofluorocarbon-substitute technologies needed to comply with CFC phaseouts required by the Montreal Protocol on Substances That Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1541 (1987). See Report of the Second Meeting of the Parties to the Montreal Protocol, Annex IV ("Indicative List of Categories of Incremental Costs").

114. See Calestous Juma, *Policy Options for Scientific and Technological Capacity-Building*, in *BIODIVERSITY PROSPECTING*, *supra* note 52.

to integrate downstream into high-tech stages of biodiversity exploitation. At each stage of development in the use of biodiversity, greater value is added to the final product: the greater the domestic capacity to carry out processing, the greater the benefit to the domestic economy, and the greater the value of the biodiversity to the country.¹¹⁵ In-country processing with technology adapted to local conditions is also more likely to provide truly useful benefits to the domestic economy. This is what INBio did in its agreement with Merck, coupling delivery of biodiversity samples with valuable information services. At the same time, the agreement ensured that the compensation from Merck included training and financed in-country technological development.

Developed countries should incorporate assistance for these measures—whether through grants, concessional loans, or technical assistance—into their bilateral aid programs. They should facilitate technology cooperation through government-to-government joint ventures and research programs and incentives, such as tax credits to the private sector.¹¹⁶

The Convention could serve as a framework for implementation of these recommendations through the development of guidelines on multilateral funding of technology transfer and bilateral aid. Proposed initial steps are described below.

115. See Juma, *supra* note 114. Reflecting the other side of the “industrial policy” debate, however, others argue that governmental support of development of biotechnology capacity where there is no comparative advantage could be an inefficient use of resources. See R. David Simpson & Roger A. Sedjo, *Contracts for Transferring Rights to Indigenous Genetic Resources*, RESOURCES, no. 109, Fall 1992, at 1, 4.

116. Article 18(5) on technical and scientific cooperation directs parties to work together to develop “joint research programmes and joint ventures for the development of technologies relevant to the objectives of [the] Convention.” Convention, *supra* note 1, art. 18(5). Article 16(4) requires parties to take measures to encourage the private sector to facilitate “access to, joint development and transfer of” biodiversity protection technology and biodiversity-derived biotechnologies. *Id.*, art. 16(4).

1. Technology Assistance Office

A technology assistance office ("TAO") could be established within the Convention secretariat that would: (1) develop criteria for (a) technologies needed for biodiversity conservation and (b) biotechnology derived from biodiversity that will be useful in the developing world; (2) develop a clearinghouse and network of information on such technologies; and (3) develop programs for international cooperation to help developing countries adapt and use such technologies.¹¹⁷ The criteria, clearinghouse and network, and programs should be developed through a public, consultative process that draws on all relevant expertise and interests and should be made as widely available as possible. The information and policy collected and developed by this office should also be used by bilateral agencies, like the U.S. Agency for International Development, and multilateral institutions, such as the World Bank.

2. Working Group on Technology Policy

Although the evidence on IPR and technology transfer is limited and many questions remain open, parties to the Convention should cooperate to study them and enrich the debate on these topics. While the TAO is charged with moving quickly to develop concrete guidelines for technology cooperation and transfer, the Working Group on Technology Policy ("WGTP") has the longer-term task of analyzing the underlying policy issues. (In the first stage, however, the personnel will overlap, and the two institutions will often work as one body.)

The WGTP will be faced with a wide variety of difficult questions. For instance, how much does IPR on needed technologies cost the developing world? Is it possible to calculate a provisional figure and add a fraction of that to the funds available under the Convention, designated for use in buying needed proprietary

117. Article 18(3) requires the Conference of the Parties to determine at its first meeting "how to establish a clearing-house mechanism to promote and facilitate technical and scientific cooperation." *Id.*, art. 18(3).

technologies? What are the differences in technology needs and IPR impacts among developing countries?

To even begin to address such questions, Convention parties need more facts. They should commission a study—possibly to be carried out by the WGTP or a subcommittee—that surveys the marketing of biotechnology products and IPR in the developing world. Among other things, the study should analyze proprietary product sales according to key variables, such as: (1) the types of products; (2) the percentage of the product's total market and total revenues in the developing world; (3) the percentage of developing world market and sales revenues held by companies based in industrialized countries; and (4) the relationship between sales of products and the degree of IPR protection.

The WGTP should also review and monitor current and subsequent research on the impact of IPR in the developing world, the process of technology transfer, and the technology needs of developing countries. It should periodically assess the state of knowledge and make specific recommendations to the parties for policy development and reform based on the state of knowledge. Criteria for the composition of the WGTP should be analogous to those for the Working Group on Biodiversity Trade.

E. Public Disclosure and Participation.

The recommendations in this article will be implemented most effectively if they are carried out under public scrutiny and with broad participation. Governments' experience with CITES has shown that NGOs can make major contributions to the effectiveness of an international environmental agreement by providing legal analysis, progressive policy recommendations, and information on implementation and enforcement.

Article 23(5) of the Convention provides that NGOs "qualified in fields relating to conservation and sustainable use of biological diversity" may be admitted as observers to Conferences of the Parties.¹¹⁸ The parties to the Convention should also implement the following measures: (1) the biodiversity treaty secretariat,

118. Convention, *supra* note 1, art. 23(5).

including the Working Group on Biodiversity Trade and the Biodiversity Trade Assistance Office, should be open and transparent to citizens and NGOs, with progressive requirements for public reporting and NGO participation in decision-making through notice-and-comment procedures; (2) country delegations should hold regular consultations between negotiators, NGOs, and other members of the public, including two-way briefing sessions before negotiations; (3) delegations should release draft position papers and analyses for comments to a wide range of organizations; (4) delegations should include NGO representatives; and (5) the Convention secretariat should include an NGO liaison office.

F. Actions by Other Institutions and Organizations

1. International Forums

While discussion is beyond the scope of this article, biodiversity trade issues must also be considered in other international forums. For instance, in the talks on Trade Related Aspects of Intellectual Property Rights (TRIPS) in the Uruguay Round of the GATT, the North American Free Trade Agreement negotiations, and elsewhere, the U.S. and other industrialized countries have argued that the failure to provide adequate protection of intellectual property should be considered an unfair trade practice. If this becomes the accepted position, consistency would require that the failure to follow the Convention's requirements for biodiversity trade—including informed consent, mutually agreed terms, and sharing of benefits of biodiversity and traditional knowledge—must also be treated as unfair trade practices under international law.

2. Unilateral Actions

Developed countries should also take measures—including inter-governmental agreements on biodiversity trade—to encourage cooperation and assistance to non-governmental or private sector efforts aimed at equitably distributing benefits from the use of

biodiversity, transferring technology, and creating incentives to conservation. The U.S., for instance, will soon begin a pilot program with these goals which will provide assistance to consortiums of academic and commercial institutions from developing and developed countries entering into biodiversity prospecting agreements. This program will focus on screening biodiversity samples for pharmaceutical leads and, if possible, developing resulting drugs and taking them to market. The International Cooperative Biodiversity Groups program, to begin in mid-1993, will be administered jointly by the National Institutes of Health, National Institutes for Mental Health, National Science Foundation, and the U.S. Agency for International Development. Additional U.S. assistance for biodiversity prospecting agreements has been proposed in Congress.¹¹⁹

3. NGO Actions

NGOs should continue to develop law and policy analysis in this area. NGOs must also increase activism at the international level and increase their efforts to link issues at the national and international levels. Negotiations on the biodiversity convention got relatively little attention from the public, the press and NGOs in the months leading up to the Earth Summit in Rio. In contrast, many NGOs participated in climate change treaty talks, receiving essential support from the Climate Action Network. While the disappointing outcome of the biodiversity talks resulted from many different factors, the lack of NGO input was widely cited as a key problem.

119. See H.R. 869, 103d Cong., 1st Sess. §§ 4, 5 (1993). The Western Hemisphere Environmental Cooperation Act of 1993, proposed by Rep. Robert Torricelli, would authorize grants to "biodiversity management organizations" ("BMOs") in tropical countries to support biodiversity prospecting transactions. The Act would also establish guidelines for eligibility: (1) at least 50% of benefits going to the biodiversity management organization must go to the source-country government for use in conservation; (2) the developed-country partner must provide equipment and training to the BMO; (3) benefits arising from use of products developed under the prospecting agreement must be "shared in a fair and equitable way with the country of origin." *Id.*

Learning from this experience, NGOs have begun forming networks to support advocacy on biodiversity policy and law. The Biodiversity Action Network ("BioNet"), formed by U.S. environmental NGOs in recent months, will help U.S. NGO biodiversity advocates form coalitions, obtain and exchange information, and coordinate positions and campaigns.¹²⁰ BioNet is now discussing global cooperation on an equal basis with other NGOs working at the international level. Other NGO networks dealing with biodiversity include the Biotechnology Working Group, the South-North Environmental Campaigns Coalition, and the Third World Network. In addition to participating in international policy discussions, it will also be important for NGOs to monitor the biodiversity trade itself.

CONCLUSION

Commercial exploitation of biodiversity is well underway, regardless of the fundamental virtues or vices of industrial capitalism or the international market economy. The Convention can serve as an international framework to support institutions and rules to manage the biodiversity trade so that it is more likely to contribute to sustainable development and biodiversity conservation. While it does not slow the trends towards commerce and commodification of living things of which biodiversity trade is an expression, it does have potential as a legal tool for increasing the environmental and societal benefits of the biodiversity trade, and for helping the public, including traditional owners and stewards of biodiversity, comment on the terms of trade.

120. Organized at the initiative of CIEL and the Sierra Club, BioNet now has over two dozen participating organizations.

INTERNATIONAL CONVENTION

CONVENTION ON BIOLOGICAL DIVERSITY¹

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

1. UNEP/Bio.Div/N7-INC.5/4.