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International Environmental Law: Contemporary Issues and the Emergence of a New World Order

EDITH BROWN WEISS*

In 1972 international environmental law was a fledgling field with less than three dozen multilateral agreements. Today international environmental law is arguably setting the pace for cooperation in the international community in the development of international law. There are nearly nine hundred international legal instruments that are either primarily directed to international environmental issues or contain important provisions on them.[1] This proliferation of legal instruments is likely to continue. Therefore, it is important to assess what we have done and explore where we are headed.

I. THE HISTORY OF INTERNATIONAL ENVIRONMENTAL LAW[2]

A. PRIOR TO 1950

Before 1900 there were few multilateral or bilateral agreements concerning international environmental issues.[3] Relevant international agreements were based on unrestrained national sovereignty over natural resources and focused primarily on boundary waters, navigation, and fishing rights along shared waterways, particularly the Rhine River and other European waterways. They did not address pollution or other ecological issues. The dramatic exception to this pattern emerged in 1909 in the United States-United Kingdom Boundary Waters Treaty,[4] which provided in Article IV that water "shall not be polluted on either side to the injury of health or property on the other."[5]

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* Professor of Law, Georgetown University Law Center. The author thanks Paul C. Szasz for his valuable comments on a draft of this article and Daniel Sullivan of *The Georgetown Law Journal* for his special assistance with preparing this article.

1. *See* EDITH BROWN WEISS ET AL., INTERNATIONAL ENVIRONMENTAL LAW: BASIC INSTRUMENTS AND REFERENCES ix (1992) (noting the existence of approximately 885 different environmentally oriented legal instruments).

2. This section is based on the author's Introductory Chapter in ENVIRONMENTAL CHANGE AND INTERNATIONAL LAW: NEW CHALLENGES AND DIMENSIONS (Edith Brown Weiss ed., 1992). For a general overview of international environmental law, see ALEXANDRE KISS & DINAH SHELTON, INTERNATIONAL ENVIRONMENTAL LAW (1991); OSCAR SCHACHTER, INTERNATIONAL LAW IN THEORY AND PRACTICE 362-88 (1991).

3. For details, see Edith Brown Weiss, Introductory Comments to Panel at American Society of International Law Annual Meeting, *in* 85 AMERICAN SOCIETY OF INTERNATIONAL LAW, PROCEEDINGS OF THE ANNUAL MEETING 401 (1991).

4. Treaty Relating to Boundary Waters Between the United States and Canada, Jan. 11, 1909, U.S.-Gr. Brit., 36 Stat. 2448 [hereinafter 1909 Boundary Waters Treaty].

5. *Id.* art. IV, 36 Stat. at 2450.

In the early 1900s, countries began to conclude agreements to protect commercially valuable species. These agreements include the 1902 Convention for the Protection of Birds Useful to Agriculture,[6] the 1916 Convention for the Protection of Migratory Birds in the United States and Canada,[7] and the Treaty for the Preservation and Protection of Fur Seals signed in 1911.[8] Only one convention focused on wildlife more generally: the 1900 London Convention for the Protection of Wild Animals, Birds and Fish in Africa.[9]

By the 1930s and 1940s, states recognized the importance of conserving natural resources and negotiated several agreements to protect fauna and flora generally. These include the 1933 London Convention on Preservation of Fauna and Flora in Their Natural State[10] (focused primarily on Africa), and the 1940 Washington Convention on Nature Protection and Wild Life Preservation[11] (focused on the Western Hemisphere). During this period, states also concluded the well known International Convention for the Regulation of Whaling,[12] as well as other conventions concerned with ocean fisheries and birds.[13]

In the first half of this century there was little development and application of customary international norms to environmental issues. The classic Trail Smelter Arbitration between Canada and the United States,[14] which affirmed Canada's responsibility for the damage from copper smelter fumes that transgressed the border into the state of Washington, was the notable exception. The language of the Arbitral Tribunal has been cited

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6. Convention for the Protection of Birds Useful to Agriculture, Mar. 19, 1902, 102 B.F.S.P. 969 (entered into force May 11, 1907).

7. Convention for the Protection of Migratory Birds, Aug. 16, 1916, U.S.-Gr. Brit., 39 Stat. 1702.

8. Treaty for the Preservation and Protection of Fur Seals, Feb. 7, 1911, U.S.-Gr. Brit., 37 Stat. 1538.

9. London Convention for the Protection of Wild Animals, Birds and Fish in Africa, May 19, 1900, 4 INTERNATIONAL PROTECTION OF THE ENVIRONMENT: TREATIES AND RELATED DOCUMENTS 1605 (B. Ruster et al. eds., 1983).

10. Convention on the Preservation of Fauna and Flora in Their Natural State, Nov. 8, 1933, 172 L.N.T.S. 241.

11. Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere, Oct. 12, 1940, 56 Stat. 1354, 161 U.N.T.S. 193.

12. Convention for the Regulation of Whaling, Sept. 24, 1931, 49 Stat. 3079, 155 L.N.T.S. 349.

13. *See, e.g.*, Convention for the Northwest Atlantic Fisheries, Feb. 8, 1949, 1 U.S.T. 477, 157 U.N.T.S. 157; Convention for the Protection of Migratory Birds and Game Mammals, Feb. 7, 1936, U.S.-Mex., 50 Stat. 1311.

14. Trail Smelter Arbitration (U.S. v. Can.), 3 R.I.A.A. 1911, 1933 (1938) (granting damages for agricultural and timber losses); 3 R.I.A.A. 1938, 1966 (1941) (establishing environmental controls to eliminate future injurious emissions). *See generally,* Arthur K. Kuhn, Comment, *The Trail Smelter Arbitration—United States and Canada,* 32 AM. J. INT'L L. 785 (1938).

widely as confirming the principle that a state is responsible for environmental damage to foreign countries caused by activities within its borders, even though in this case Canada's liability for the damage was determined in the compromise establishing the Tribunal.[15] One of the most important aspects of the Arbitration is the Tribunal's decision that if there is a threat of serious continuing harm, the state must cease the harmful conduct (which implies that damages would not be sufficient). The Tribunal required the parties to effectuate a monitoring regime to ensure that further damaging pollution did not occur. Because the Trail Smelter Arbitration is a rare example of international environmental adjudication in this early period, it has acquired an unusually important place in the jurisprudence of international environmental law.

B. 1950-1972

During the 1950s and early 1960s, the international community was concerned with nuclear damage from civilian use (a by-product of the Atoms for Peace Proposal[16]) and marine pollution from oil. Thus, countries negotiated agreements governing international liability for nuclear damage and required measures to prevent oil pollution at sea.[17]

In the 1960s, environmental issues began to emerge within countries. Rachel Carson published her famous book *Silent Spring*,[18] and comparable books were published in European countries. In the United States, this new environmental awareness led to the adoption of the first major piece of federal environmental legislation, the National Environmental Policy Act of 1969,[19] which initiated the environmental impact statement. In 1971 the U.S. Council on Environmental Quality and the U.S. Environmental Protection Agency were formed.[20]

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15. The Arbitral Tribunal noted:

> [U]nder the principles of international law, as well as of the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.

Trail Smelter Arbitration, 3 R.I.A.A. at 1965.

16. *See* President Dwight D. Eisenhower, United States "Atoms for Peace" Proposal, Address Before the General Assembly (Dec. 8, 1953), *in* 1 DEP'T ST., DOCUMENTS ON DISARMAMENT—1945-1959, at 393, 399 (1960) (calling for joint contributions of fissionable material to develop peaceful uses of nuclear power).

17. *See, e.g.*, Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 956 U.N.T.S. 251; International Convention for the Prevention of Pollution of the Sea by Oil, May 12, 1954, 12 U.S.T. 2989, 327 U.N.T.S. 3.

18. RACHEL CARSON, SILENT SPRING (1963).

19. 42 U.S.C. § 4321 (1988).

20. 40 C.F.R. § 1500 (1991) (implementing Pub. L. No. 91-190, 42 U.S.C. 4321); 40

Internationally, during the 1960s, multilateral international environmental agreements increased significantly. Conventions were negotiated relating to interventions in case of oil pollution casualties, to civil liability for oil pollution damage, and to oil pollution control in the North Sea.[21] The African Convention on the Conservation of Nature and Natural Resources was concluded in 1968.[22]

C. 1972 AND BEYOND: THE MODERN ERA OF INTERNATIONAL ENVIRONMENTAL LAW

Modern international environmental law dates to approximately 1972 when countries gathered for the United Nations Stockholm Conference on the Human Environment, and the United Nations Environment Programme (UNEP) was established.[23] Many important legal developments took place in the period surrounding the Conference, including negotiation of the Convention on International Trade in Endangered Species,[24] the London Ocean Dumping Convention,[25] the World Heritage Convention,[26] and the first of the UNEP regional seas conventions.[27] Since then, there has been a rapid rise in international legal instruments concerned with the environment, to the point that we are concerned today with developing new means for coordinating the negotiation and implementa-

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C.F.R. § 1.1 (1991) (implementing Reorganization Plan No. 3 of 1970), *reprinted in* 5 U.S.C. app. at 1343 (1988).

21. *See, e.g.,* Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, Nov. 29, 1969, 26 U.S.T. 765, 970 U.N.T.S. 211; Convention on Civil Liability for Oil Pollution Damage, Nov. 29, 1969, 12 U.S.T. 2989, 3 U.N.T.S. 3; Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil, June 9, 1969, 704 U.N.T.S. 3.

22. Convention on the Conservation of Nature and Natural Resources, Sept. 15, 1968, 1001 U.N.T.S. 3 (attempting to conserve renewable resources including soil, water, flora, and fauna in Africa).

23. *Report on the United Nations Conference on the Human Environment at Stockholm,* 11 I.L.M. 1416 (1972).

24. Convention on International Trade in Endangered Species of Wild Fauna and Flora, Mar. 3, 1973, 27 U.S.T. 1087, 993 U.N.T.S. 243 [hereinafter CITES].

25. Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Dec. 29, 1972, 26 U.S.T. 2403, 1046 U.N.T.S. 120 [hereinafter London Ocean Dumping Convention].

26. Convention for the Protection of World Cultural and Natural Heritage, Nov. 23, 1972, 27 U.S.T. 37, 1037 U.N.T.S. 151 [hereinafter World Heritage Convention].

27. The United Nations Environment Programme initiated the Mediterranean Action Plan in 1975 to control marine and coastal pollution. This led to the Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution, Feb. 16, 1976, 15 I.L.M. 290, and the two accompanying protocols, Barcelona Protocol Concerning Cooperation in Combatting Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency, Feb. 16, 1976, 15 I.L.M. 306, and Barcelona Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft, Feb. 16, 1976, 15 I.L.M. 300.

tion of related agreements, in particular their administrative, monitoring, and financial provisions.

Since 1970, hundreds of international environmental instruments have been concluded. Including bilateral and multilateral instruments (binding and nonbinding), there are close to nine hundred international legal instruments that have one or more significant provisions addressing the environment.[28] Within the last two years alone, there have been about a dozen highly important multilateral negotiations occurring more or less in parallel.[29]

D. HISTORICAL DEVELOPMENTS: THE CHANGING THEMES AND FOCUS OF INTERNATIONAL ENVIRONMENTAL LAW AGREEMENTS

The subject matter of international environmental agreements now bears little resemblance to that in agreements concluded in the first half of this century, which focused on boundary rivers, fishing rights, and protection of particularly valued animal species. Today there are agreements to control pollution in all environmental media, conserve habitats, protect global commons, such as the high-level ozone layer,[30] and protect resources located within countries that are of concern to the international community. Moreover, the U.N. Conference on Environment and Development held last June in Rio de Janeiro, Brazil, suggests that we are entering a new phase in international environmental law in which environmental and economic issues will be joined.

The scope of international agreements has expanded significantly since 1972: from transboundary pollution agreements to global pollution agreements; from control of direct emissions into lakes to comprehensive river basin system regimes; from preservation of certain species to conservation of ecosystems; from agreements that take effect only at national borders

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28. WEISS ET AL., *supra* note 1, at ix.

29. From 1990-1992, these included the negotiations for the environmental protocol and annexes to the Antarctic Treaty; the Framework Convention on Climate Change; the Convention on Biological Diversity; the United Nations Economic Commission for Europe (U.N.-ECE) agreements on environmental impact assessment, industrial accidents, volatile organic chemicals, and freshwaters and lakes; the treaty on oil pollution preparedness, response, and cooperation; the draft agreement on marine transport of hazardous and noxious substances; the draft protocol on liability to the Basel Convention on transboundary movements of hazardous waste; the forest principles; the arctic protection strategy; the UNCED Agenda 21; and the Rio Declaration on Environment and Development.

30. *See, e.g.*, Convention for the Protection of the Ozone Layer, Mar. 22, 1985, S. TREATY DOC. NO. 9, 99th Cong., 1st Sess. 22 (1985), 26 I.L.M. 1529 (entered into force Sept. 22, 1988); Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, S. TREATY DOC. NO. 10, 100th Cong., 1st Sess. 2 (1987), 26 I.L.M. 1550 (entered into force Jan. 1, 1989) [hereinafter Montreal Protocol] (attempting to reduce harmful emissions that deplete the ozone layer and adversely affect human health).

to ones that restrain resource use and control activities within national borders, such as for world heritages, wetlands, and biologically diverse areas. The duties of the parties to these agreements have also become more comprehensive: from undertaking research and monitoring to preventing pollution and reducing certain pollutants to specified levels. Notably, there is no example in which the provisions of earlier conventions have been weakened; rather, they have been strengthened or their scope has been expanded.

The international community is increasingly aware that it is important not only to monitor and research environmental risks, but also to reduce them. Thus states have moved from international agreements that mainly address research, information exchange, and monitoring to agreements that require reductions in pollutant emissions and changes in control technology. The Protocol on Sulphur Dioxide to the United Nations Economic Commission for Europe (U.N.-ECE) Convention on Long-Range Transboundary Air Pollution[31] calls for a thirty percent reduction in national annual sulphur emissions or their transboundary fluxes by 1993,[32] and the Montreal Protocol on Substances That Deplete the Ozone Layer,[33] including the 1990 Adjustments and Amendments,[34] requires that chlorofluorocarbons and halons, except for essential uses, be phased out by the year 2000.[35] This emphasis on preventing pollution is likely to continue as we appreciate that the capacity of our environment to absorb the byproducts of production and consumption is limited.

The last seven years, from 1985 to 1992, illustrate the increasingly rapid development of international environmental law. During this period, countries have negotiated a surprisingly large number of global agreements. These include the Vienna Convention on the Protection of the Ozone Layer;[36] the Montreal Protocol on Substances that Deplete the Ozone Layer with the London Adjustments and Amendments;[37] the Protocol on

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31. Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution or the Reduction of Sulphur Emissions on Their Transboundary Fluxes by at Least 30 Percent, July 8, 1985, 27 I.L.M. 707 (entered into force Sept. 2, 1987) [hereinafter 1985 Helsinki Protocol].

32. *Id.* art. II, 27 I.L.M. at 708.

33. Montreal Protocol, *supra* note 30.

34. *Report of the Second Meeting of the Parties to the Montreal Protocol on Substances That Deplete the Ozone Layer,* U.N. Environment Programme, 2d Sess., Annex 1, Agenda Item 5, U.N. Doc. UNEP/OzL.Pro.2/3 (1990).

35. Montreal Protocol, *supra* note 30, art. II, S. TREATY DOC. NO. 10, at 2-3, 26 I.L.M. at 1552-53.

36. Convention for the Protection of the Ozone Layer, *supra* note 30.

37. Montreal Protocol, *supra* note 30; Adjustments and Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer, June 29, 1990, 30 I.L.M. 537, 539-41 [hereinafter Adjustments and Amendments to the Montreal Protocol].

Environmental Protection (with annexes) to the Antarctic Treaty;[38] the Basel Convention on the Transboundary Movements of Hazardous Wastes and Their Disposal;[39] the two International Atomic Energy Agency (IAEA) Conventions on Early Notification of a Nuclear Accident[40] and on Assistance in the Case of a Nuclear Accident or Radiological Emergency;[41] the International Convention on Oil Pollution Preparedness, Response and Co-operation;[42] the Framework Convention on Climate Change;[43] the Convention on Biological Diversity;[44] the principles on forests;[45] the non-binding legal instrument of the Arctic Environmental Protection Strategy;[46] and the London Guidelines for the Exchange of Information on Chemicals in International Trade.[47]

Developments at the regional level have proceeded at a similar rate. Member states of the United Nations Economic Commission for Europe[48] have negotiated three protocols to the U.N.-ECE Convention on Long-Range Transboundary Air Pollution:[49] a protocol providing for a thirty percent reduction in transborder fluxes of sulphur dioxides,[50] a protocol

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38. Treaty Respecting the Antarctic, Dec. 1, 1959, 12 U.S.T. 794, 402 U.N.T.S. 71; Protocol on Environmental Protection to the Treaty Regarding the Antarctic, June 21, 1991, S. TREATY DOC. NO. 22, 102d Cong., 2d Sess. (1992), 30 I.L.M. 1455.

39. Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, S. TREATY DOC. NO. 5, 102d Cong., 1st Sess. (1991), 28 I.L.M. 657 [hereinafter Basel Convention].

40. Convention on Early Notification of a Nuclear Accident, Sept. 26, 1986, S. TREATY DOC. NO. 4, 100th Cong., 1st Sess. (1987), 25 I.L.M. 1370.

41. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Sept. 26, 1986, S. TREATY DOC. NO. 4, 100th Cong., 1st Sess. (1987), 25 I.L.M. 1377 (entered into force Oct. 27, 1986).

42. Convention on Oil Pollution Preparedness, Response and Cooperation, Nov. 30, 1990, 30 I.L.M. 733.

43. Framework Convention on Climate Change, May 9, 1992, 31 I.L.M. 849.

44. Convention on Biological Diversity, June 5, 1992, 31 I.L.M. 818.

45. Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests, June 13, 1992, 31 I.L.M. 881 [hereinafter Forest Principles].

46. Arctic Environmental Protection Strategy, June 14, 1991, 30 I.L.M. 1624.

47. London Guidelines for the Exchange of Information on Chemicals in International Trade (Amended 1989), U.N. Environmental Programme, 15th Sess., at 15-26, U.N. Doc. UNEP GC/DEC/15/30 (1989).

48. As of 1992, the U.N.-ECE included the following countries: Albania, Austria, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Canada, Croatia, Cyprus, Czech and Slovak Federal Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, San Marino, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United States, United Kingdom, and Yugoslavia.

49. Convention on Long Range Transboundary Air Pollution, Nov. 13, 1979, T.I.A.S. No. 10, 541, 18 I.L.M. 1442 (entered into force Mar. 16, 1983).

50. 1985 Helsinki Protocol, *supra* note 31, art. II, 27 I.L.M. at 708.

freezing the emissions of nitrogen oxides,[51] and a protocol controlling emissions of volatile organic chemicals.[52] These countries have also concluded agreements on environmental impact assessment, transnational industrial accidents, and transboundary fresh waters and lakes.[53]

As part of the United Nations Environment Programme's regional seas program, countries have negotiated the South Pacific Resource and Environmental Protection Agreement[54] with two protocols, one on dumping[55] and the other on emergency assistance.[56] Under the UNEP Caribbean Regional Seas Convention,[57] parties have concluded a protocol on protected areas[58] and are considering negotiation of a protocol on land-based sources of marine pollution.

There have been similar advances in legal instruments to safeguard freshwater resources. States concluded an unusually comprehensive agreement to protect the Zambezi River Basin.[59] In 1987, Canada and the United States agreed to a protocol to their 1978 Great Lakes Water Quality Agreement,[60] which addresses groundwater contamination affecting the Great Lakes and the airborne transport of toxics into the Great Lakes.[61] Amazon Basin countries issued the Declaration of Brasilia[62] and provided for the establishment of two new commissions under the auspices

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51. Protocol to the Convention on Long-Range Transboundary Air Pollution, Oct. 31, 1988, art. II, cl. 1, 28 I.L.M. 212, 216 (entered into force 1991) [hereinafter Sofia Protocol].

52. Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution Concerning the Control of Emissions of Volatile Organic Compounds or Their Transboundary Fluxes, 31 I.L.M. 573 (1991) [hereinafter LRTAP VOC Protocol].

53. *See, e.g.*, Convention on Environmental Impact Assessment in a Transboundary Context, Feb. 25, 1991, 30 I.L.M. 800; United Nations, Economic Commission for Europe, Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Mar. 17, 1992, 31 I.L.M. 1312; United Nations, Commission for Europe, Draft Convention on the Transboundary Effects of Industrial Accidents, Mar. 17, 1992, 31 I.L.M. 1330 [hereinafter U.N.-ECE Convention on Transboundary Industrial Accidents].

54. Convention for the Protection of the Nautical Resources and Environment of the South Pacific Region, Nov. 25, 1986, 26 I.L.M. 38 (entered into force Aug. 22, 1990).

55. Protocol for the Prevention of Pollution of the South Pacific Region by Dumping, Nov. 25, 1986, 26 I.L.M. 65 (entered into force Aug. 22, 1990).

56. Protocol Concerning Co-Operation in Combating Pollution Emergencies in the South Pacific Region, Nov. 25, 1986, 26 I.L.M. 59 (entered into force Aug. 22, 1990).

57. Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, Mar. 24, 1983, T.I.A.S. No. 11,085, 22 I.L.M. 227 (entered into force Oct. 11, 1986).

58. Protocol Concerning Specially Protected Areas and Wildlife, Jan. 16, 1990, 19 ENVTL. POL'Y L. 224 (1990) (not in force).

59. Agreement on the Action Plan for the Environmentally Sound Management of the Common Zambezi River System, May 28, 1987, 27 I.L.M. 1109 (entered into force upon signature).

60. Agreement on Great Lakes Water Quality, Nov. 22, 1978, Can.-U.S., 30 U.S.T. 1383.

61. Protocol Respecting Great Lakes Water Quality, Oct. 16, 1987, Can.-U.S., T.I.A.S. No. 10,798.

62. Declaration of Brasilia, Mar. 31, 1989, 28 I.L.M. 1311.

of the Amazon Pact,[63] one to conserve the fauna and flora and the other to protect indigenous peoples. In Asia, members of the Association of Southeast Asian Nations (ASEAN) concluded the Convention on the Conservation of Nature, which provides ecosystem protection and controls on trade in endangered species.[64] And in Africa, the Bamako Convention on Hazardous Wastes bans the importation of hazardous wastes and creates a strict regimen for moving such wastes within the African continent.[65]

In Europe, the Single European Act[66] now provides clear authority for the European Community to act on environmental and natural resource issues.[67] The Community has already issued many directives and regulations aimed at controlling pollution and protecting the environment, and more are under consideration. The European Court of Justice has assumed an important role in ensuring that measures adopted by individual nations conform with Community directives. A new European Environment Agency is being established as part of the institutional framework of the European Community.[68]

At the bilateral level, many international environmental legal instruments have been concluded during this period. In North America, the United States has signed bilateral agreements with Canada and Mexico on the transport of hazardous wastes.[69] An agreement between Mexico and the United States addresses urban air pollution problems in Mexico City.[70] In 1991, Canada and the United States concluded an agreement to control acid precipitation.[71] In Latin America, Brazil and Argentina concluded an

63. Treaty for Amazonian Cooperation, July 3, 1987, 17 I.L.M. 1045.

64. Agreement on the Conservation of Nature and Natural Resources, July 9, 1985, 15 ENVTL. POL'Y & L. 64 (1985) [hereinafter ASEAN Conservation Agreement]. It should be noted that this agreement is not yet in effect. The ASEAN countries include Brunei, Darussalam, Indonesia, Malaysia, Philippines, Singapore, and Thailand.

65. Bamako Convention on the Ban of Import into Africa and the control of Transboundary Movement of Hazardous Wastes Within Africa, Jan. 29, 1991, 30 I.L.M. 773 [hereinafter Bamako Convention].

66. Single European Act, Feb. 17, 1986, 25 I.L.M. 503 (entered into force July 1, 1987).

67. *Id.*, § II, § VI, title VII. art. 130R, cl. 4, 25 I.L.M. at 515.

68. Council Regulation 1210/90 of 7 May 1990 on the Establishment of the European Environment Agency and the European Environment Information and Observation Network, 1990 O.J. (L120) 1.

69. *See, e.g.*, Agreement Concerning the Transboundary Movement of Hazardous Waste, Oct. 28, 1986, Can.-U.S., T.I.A.S. No. 11,099; Agreement of Cooperation Regarding Transboundary Shipments of Hazardous Wastes and Hazardous Substances, Nov. 12, 1986, U.S.-Mex., Annex III, 26 I.L.M. 25 (entered into force Jan. 29, 1987).

70. Agreement on Cooperation for the Protection and Improvement of the Environment in the Metropolitan Area of Mexico, Oct. 3, 1981, U.S.-Mex., 29 I.L.M. 25 (entered into force Aug. 22, 1990).

71. Agreement on Air Quality, Mar. 13, 1991, Can.-U.S., 30 I.L.M. 676.

agreement that provides for consultation in case of nuclear accidents in either country.[72]

Most of these agreements were considered impossible ten years ago; some were thought impossible only months before they were concluded. The provisions in the new agreements are generally more stringent and detailed than in previous ones, the range of subject matter broader, and the provisions for implementation and adjustment more sophisticated. This history is encouraging because it suggests that the international community's learning curve as reflected in international environmental law is surprisingly steep. This should give us hope that we may be able, with some success, to address the immense challenges of global environmental change and to meet the urgent need for environmentally sustainable development.

II. THE LESSONS LEARNED

In reviewing the past forty years in international environmental law, it is apparent that countries have learned much about both the process of negotiating international environmental agreements and the desirable substantive content of the agreements.

For purposes of this analysis, learning can be defined as social evolutionary progress. Most learning is unconscious, unsystematic, and more or less constant. It takes place through negative and positive feedback to action. States and other organizations, just like individuals, naturally adjust their approaches and procedures to emulate successes and avoid past mistakes.

Some factors seem to facilitate learning: ready access to information, monitoring, prompt feedback, and political pressures for change. Other factors constrain it. Constitutional provisions and other domestic legal instruments may limit available options. Rigid political controls imposed because of tensions among participants may prevent adjustments that experience would otherwise suggest as prudent. An established record of success may delay change even when circumstances are altered, and the old ways no longer correspond to current needs. Similarly, lack of time to explore new approaches, and vested interests in the status quo or in positions that have already been cleared with relevant authorities may make it difficult to change established diplomatic positions.

It is difficult to assess scientifically the learning capacity of the international community in its ability to address environmental issues. To do so would require a learning methodology, which would indicate the factors to

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72. Declaracion Conjunta Sobre Politica Nuclear, Dec. 10, 1986, Arg.-Braz., Integracion Latinoamericana, 12 (122), Apr. 1987, 70. The Agreement was concluded contemporaneously with the two IAEA agreements on notification and provision of emergency assistance in case of nuclear accident.

be considered and the units of measurement.[73] While such a comprehensive effort would be a worthwhile undertaking, this analysis stops short of such a goal. Rather this article sets forth preliminary insights built upon a review of state behavior in negotiating and implementing international environmental agreements over the last forty years.[74]

A. SKILL AND RAPIDITY IN NEGOTIATING INTERNATIONAL AGREEMENTS

Contrary to popular myth, the international community has become very skilled at negotiating international agreements. Countries negotiated nine years (from December 1973 to December 1982) to conclude the Law of the Sea Convention,[75] which admittedly was a herculean effort to conclude a comprehensive, detailed, and definitive agreement, which would in part codify the rules relating to the various uses of the oceans. By contrast, countries today are negotiating complicated agreements in only a few years, often developing entirely new areas of law.[76] Countries negotiated the complex Climate Framework Convention[77] in fifteen months (from February 1991 to May 1992). Negotiations for the Environmental Protocol to the Antarctic Treaty[78] (which includes four detailed annexes) and for the Biological Diversity Convention[79] required less than two years, as did the complex agreements on industrial accidents[80] and volatile organic chemicals[81] under the auspices of the U.N.-ECE. It is now rare for countries to need more than two years to negotiate even complicated, detailed

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73. For an attempt to develop this methodology, see Edward A. Parson & William C. Clark, Learning to Manage Global Environmental Change: A Review of Relevant Theory (1991) (unpublished discussion paper, on file with the Center for Science and International Affairs, Cambridge, Mass.).

74. For an excellent brief inquiry into the learning patterns of international institutions concerned with issues such as nuclear energy, see Paul C. Szasz, *Restructuring the International Organizational Framework; Annex: The Learning Capacity of International Organizations, in* ENVIRONMENTAL CHANGE AND INTERNATIONAL LAW: NEW CHALLENGES AND DIMENSIONS 340, 377-84 (Edith Brown Weiss ed., 1992).

75. Convention on the Law of the Sea, Dec. 10, 1982, 21 I.L.M. 1261 (not in force). For a history of the prenegotiations in the preceding five years, see ANN L. HOLLICK, U.S. FOREIGN POLICY AND THE LAW OF THE SEA 196-239 (1981).

76. Paul C. Szasz has observed that it may be easier to negotiate agreements in new fields because there is less existing law to be considered. The negotiation for the Law of the Sea Convention was in part an exercise in codifying existing norms, which was a contentious process. Letter from Paul C. Szasz, former Deputy Legal Counsel and Director of the General Legal Division at the United Nations, to Professor Edith Brown Weiss, Georgetown University Law Center (Nov. 18, 1992).

77. Framework Convention on Climate Change, *supra* note 43.

78. Protocol on Environmental Protection to the Treaty Regarding the Antarctic, *supra* note 38.

79. Convention on Biological Diversity, *supra* note 44.

80. U.N.-ECE Convention on Transboundary Industrial Accidents, *supra* note 53.

81. LRTAP VOC Protocol, *supra* note 52.

international agreements. Agenda 21,[82] a nonbinding instrument, offers perhaps the most striking evidence of the skill of the international community in achieving these ends. In less than two years, countries negotiated an approximately 850 page text setting forth strategies for the multiple and complex issues raised by environment and development.[83] Thus, countries have evolved a negotiating process in the international environmental field that leads to rapid conclusion of agreements.[84]

B. CHANGES IN DESIGN AND CONTENT OF AGREEMENTS

International agreements have become increasingly detailed and operational. The provisions of the 1940 Western Hemisphere Convention on the Conservation of Nature[85] and the World Heritage Convention[86] are broad and general. By contrast, the provisions included in the Biological Diversity Convention,[87] the ASEAN Agreement on the Conservation of Nature and Natural Resources,[88] or the Protected Areas Protocol to the Caribbean Regional Seas Convention[89] are more detailed even if still somewhat general. Recent agreements controlling transboundary pollution have become much more specific and operational than previous efforts. The early U.N.-ECE Protocol on Sulphur Dioxide to the U.N.-ECE Long-Range Transboundary Air Pollution Convention[90] sets forth a general obligation to reduce transboundary fluxes by thirty percent,[91] while the new Protocol on Volatile Organic Chemicals[92] provides far more detailed and specific reduction requirements.[93] Similarly, very detailed obligations appear in the Montreal Protocol on Substances That Deplete

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82. *United Nations Conference on Environment and Development,* Agenda Item 21, U.N. Doc. A/Conf. 151/PC/100/Add. 1 (1992) [hereinafter Agenda 21].

83. Countries have also demonstrated skill in concluding agreements quickly in other areas, as evidenced by the successful negotiation of the North American Free Trade Agreement between Canada, Mexico, and the United States, which required slightly over a year to conclude. North American Free Trade Agreement, Dec. 17, 1992 (Sept. 8, 1992 released edition) (implementing legislation necessary to ratify the agreement is likely to be introduced in Congress in 1993).

84. For a chronology of principal developments in international legislation regarding the atmosphere, see Paul C. Szasz, *International Norm-making: Annex, in* ENVIRONMENTAL CHANGE AND INTERNATIONAL LAW: NEW CHALLENGES AND DIMENSIONS 41, 75-80 (Edith Brown Weiss ed., 1992).

85. Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere, *supra* note 11.

86. Convention for the Protection of World Cultural and Natural Heritage, *supra* note 26.

87. Convention on Biological Diversity, *supra* note 44.

88. ASEAN Conservation Agreement, *supra* note 63.

89. Protocol Concerning Specially Protected Areas and Wildlife, *supra* note 58.

90. 1985 Helsinki Protocol, *supra* note 31.

91. *Id.* art. 6, 27 I.L.M. at 709.

92. LRTAP VOC Protocol, *supra* note 52.

93. *See, e.g., id.* at 575-80, 583-611.

the Ozone Layer[94] and in the Basel Convention,[95] which controls the transboundary shipment of hazardous wastes, both concluded in the last five years.

The design of agreements has also evolved. In contrast to the traditional practice of negotiating a single agreement for an issue, such as use of boundary waters, or negotiating comprehensively all of the issues in an international environmental matter,[96] countries experimented in the first UNEP Regional Seas Convention in 1976[97] with adopting a framework convention complemented by at least one accompanying comprehensive protocol. This approach has been followed in all subsequent UNEP regional seas conventions. This more open-ended framework allowed countries to begin to take coordinated actions to conserve regional seas but avoided premature negotiations on more complicated issues in the region. This piecemeal negotiation strategy was adopted by the countries of the U.N.-ECE[98] in 1979 when they concluded the Convention on Long-Range Transboundary Air Pollution,[99] which set forth a general framework for monitoring and exchanging information on air pollution in the region. This was followed by protocols among the U.N.-ECE countries establishing a monitoring system and controlling emissions of certain chemicals.[100] Countries adopted a similar negotiating process to address the problem of global ozone depletion: first the Vienna Convention for the

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94. *See, e.g.,* Montreal Protocol, *supra* note 30, art. 2, S. TREATY DOC. NO. 10, at 2, 26 I.L.M. at 1552 (requiring parties to meet annual control measures with regard to the specific consumption levels of certain controlled substances, defined as national production plus imports minus exports of the controlled substance on an annual basis); *id.* art. 3, S. TREATY DOC. NO. 10, at 4, 26 I.L.M. at 1554 (determining how to calculate these levels of consumption).

95. *See, e.g.,* Basel Convention, *supra* note 39, art. 4(5), S. TREATY DOC. NO. 5, 102d Cong., 1st Sess. at 10, 28 I.L.M. at 662 (prohibiting parties from exporting hazardous wastes to nonparties).

96. Convention on the Law of the Sea, *supra* note 75, which took eight years to negotiate, illustrates this all-encompassing approach. This approach has obvious drawbacks, the most obvious of which is that the more ambitious the goals, the more issues upon which the participating countries must reach agreement. Delay and lengthy negotiations become the rule, rather than the exception, in these settings.

97. Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution, *supra* note 27; Barcelona Protocol Concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency, *supra* note 27; Barcelona Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft, *supra* note 27.

98. *See supra* note 48 (listing the members of U.N.-ECE).

99. Convention on Long-Range Transboundary Air Pollution, *supra* note 49.

100. *See* Protocol on Long-Term Financing of the Co-Operative Programme for Monitoring and Evaluation of the Long Range Transmission of Air Pollutants in Europe, Sept. 28, 1984, 24 I.L.M. 484 (providing a funding mechanism for the monitoring system); 1985 Helsinki Protocol, *supra* note 31, 27 I.L.M. at 707 (limiting sulphur emissions); Sofia Protocol, *supra* note 51, 28 I.L.M. at 212 (limiting nitrogen oxides emissions).

Protection of the Ozone Layer,[101] which set forth a general framework for monitoring, exchanging information, and facilitating scientific research, followed by a more detailed Montreal Protocol[102] setting forth a complex regime for controlling chemical depletion of the ozone layer.

In the case of regional seas, countries agreed that the framework agreement could only go forward if they had also concluded at least one protocol to accompany it. This meant that states had to demonstrate serious intent to participate in the arrangements to protect the regional seas in order to become a party to the framework agreement. On the other hand, this requirement broke the management scheme into individual pieces, so that states could develop the protocols over time and become parties to some but not others. By contrast, in the context of controlling transboundary air pollution, protecting the ozone layer, and managing climate change countries have concluded the framework agreement before reaching agreement on, and often before negotiating, any detailed substantive protocols. In such cases, if countries agree to participate in the framework convention, they may become sufficiently engaged that they can subsequently agree upon supplementing protocols.

C. ADJUSTMENTS TO CHANGES IN SCIENTIFIC UNDERSTANDING

Scientific uncertainty is inherent in all international environmental law. We do not have a full understanding of the natural system or of our interactions with it. Our scientific understanding is always changing, as is our technological knowledge and know-how. Consequently, those who draft international agreements have had to design instruments and implementation mechanisms that have sufficient flexibility in order to allow parties to adapt to changes in our scientific understanding and technological abilities.

Early agreements had no special processes for adjusting to changes in the scientific understanding of the problem. Even if there were schedules attached to the agreements, they could be amended only by the traditional process of establishing a negotiating forum, agreeing upon the changes, adopting them, and then obtaining the number of ratifications required by the treaty for them to enter into force. This traditional procedure has proved to be too cumbersome to address rapid scientific advances. Later agreements have eased the process by providing for periodic meeting of the parties, for the formulation of technical changes by experts or interna-

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101. Convention for the Protection of the Ozone Layer, *supra* note 30.

102. Montreal Protocol, *supra* note 30, art. III, S. TREATY DOC. NO. 10, at 4, 26 I.L.M. at 1554 (regime establishing limits based on multiplication of annual production of each controlled substance by its ozone depleting potential). Countries were unable to agree upon the Protocol during the negotiations for the Vienna Convention.

tional secretariats subject to confirmation by the parties, and entry into force by agreement of the parties without ratification. For example, the Montreal Protocol on Substances that Deplete the Ozone Layer[103] provides for parties to meet at regular intervals to respond to new scientific findings,[104] for regular technical assessments to be made available to parties before a meeting,[105] and for simplified adjustment procedures by which parties can agree to reduce consumption of listed chemicals faster and further than provided in the text without having to use formal and time consuming amendment procedures.[106]

In an effort to promote flexibility the new Climate Framework Convention[107] provides for a standing body to provide scientific and technological advice on a timely basis.[108] This body will provide scientific assessments of climate change and its effects, and the impact of implementing measures under the Convention. It will also identify relevant new technologies, assist in building local capacity for scientific research and assessment, and respond to scientific inquires of the parties.[109] In sum, this body establishes a process for integrating scientific and technological advances into the operation of the Climate Framework Convention. In so doing, it reflects the experience of the negotiators to the Intergovernmental Panel on Climate Change, which helped to generate the scientific consensus among governments to move forward to negotiate the Convention.

All environmental issues involve scientific uncertainty and hence risks. A major challenge to policymakers is to identify, assess, and manage the risks inherent in scientific uncertainty. This calls for systems for monitoring, providing early warning, and prioritizing risks because there are always limited resources available to address these risks. Recent international agreements, such as those on climate and on biological diversity, include at least some provisions along these lines.

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103. Montreal Protocol, *supra* note 30.

104. *Id.* art. 11, S. TREATY DOC. NO. 10, at 7, 26 I.L.M. at 1557-58.

105. *Id.* art. 6, S. TREATY DOC. NO. 10, at 6, 26 I.L.M. at 1556 (calling for assessment of the control measures of Art.2 at least every four years and for expert panels to report their conclusions to the parties within one year prior to the parties being convened).

106. *Id.* arts. 2(9), 2(10), S. TREATY DOC. NO. 10, at 4, 26 I.L.M. at 1553-54. Thus, the adjustments agreed to by the parties to fully phase out chlorofluorocarbons by the year 2000 and all but essential uses of halons came into effect in March 1991. Adjustments and Amendments to the Montreal Protocol, *supra* note 37, at 539-41. The Amendments, which put new chemicals on the list of regulated substances, did not come into effect until August 1992. *Id.* at 541-53. For an account of the effect of scientific uncertainty on the negotiation of the Montreal Protocol, see generally RICHARD BENEDICT, OZONE DIPLOMACY (1991).

107. Framework Convention on Climate Change, *supra* note 43.

108. *Id.* art. 9, 31 I.L.M. at 863.

109. *Id.*

The precautionary principle, or precautionary approach, in international environmental law is one response to the recognition that we are faced with the necessity to act in the face of scientific uncertainty about future harm. The principle lowers the burden of proof required for taking action against proposed or existing activities that may have serious long-term harmful consequences. There is no agreement on the content of this principle, or even as to whether an actual principle has emerged or only an approach to address a problem.[110] Nevertheless, countries have begun to develop precise and useful formulations of the principle in specific contexts, such as implementation of the London Ocean Dumping Convention.[111]

D. A SYSTEMS FOCUS

As our understanding of the environment has grown, we have recognized that agreements need to be directed to conserving ecological systems, not only to controlling specific pollutants or conserving particular species. This insight has been increasingly reflected in international instruments.

For example, the ASEAN Convention on the Conservation of Resources[112] addresses the conservation of ecosystems and habitats as a central means of conserving endangered species.[113] The new Biological Diversity Convention[114] focuses on the conservation of ecosystems and

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110. For an analysis of the precautionary principle, see Daniel Bodansky, *Scientific Uncertainty and the Precautionary Principle,* 33 ENV'T 4 (1991) (providing a skeptical analysis); M.P.A. Kindall, *UNCED and the Evolution of Principles of International Environmental Law,* 25 JOHN MARSHALL L. REV. 19, 23 (1991) (suggesting elements to include in a precautionary approach); James Cameron & Jacob D. Werksman, The Precautionary Principle: A Policy for Action in the Face of Uncertainty (paper presented at the Centre for International Environmental Law, Kings College, London (Jan. 1991)).

111. *See* London Ocean Dumping Convention, *supra* note 25. At the fall 1991 meeting of the parties to the London Ocean Dumping Convention, countries agreed to be guided by a "precautionary approach" in implementing the Convention. They would take preventive action when there is reason to believe the dumped material is likely to cause harm even when there is no conclusive evidence to prove a causal link to certain effects, and they would be guided by certain specific measures in carrying out this approach. *The Application of a Precautionary Approach in Environmental Protection Within the Framework of the London Dumping Convention,* IMO Assembly Res. LDC 44(14) (Nov. 1991 14th Consultative meeting) (on file with author); P.J. Taylor & T. Jackson, The Precautionary Principle and the Prevention of Marine Pollution, Paper presented at the International Ocean Pollution Symposium, Puerto Rico (Apr. 1991).

112. ASEAN Conservation Agreement, *supra* note 63.

113. *See id.* arts. 3-9; 15 ENVTL. POL'Y & L. at 64-65 (calling for specific measures to conserve and protect habitats, prevent changes in ecosystems, preserve vegetation cover, prevent soil erosion, and conserve underground and surface water resources as a means of preserving genetic diversity).

114. Convention on Biological Diversity, *supra* note 44.

habitats in full recognition that many of the species that should be conserved are microorganisms or other species about which we know little or nothing.[115] The 1978 Great Lakes Water Quality Agreement[116] modified language in the 1972 Agreement to include reference to basin-wide ecosystems in the Great Lakes.[117] The 1987 Protocol to the Agreement[118] includes annexes that explicitly address ground water pollution and atmospheric transport of pollutants as sources of Great Lakes contamination.[119] The change reflects the recognition that what feeds into lakes through the air and ground water is as relevant as direct discharges into the lake in determining its quality. Similarly, in marine pollution the focus is no longer primarily on specific commodities that are dumped into the marine environment, but also on maintaining ecosystems as a whole. This is reflected in new protocols to protect designated areas in regional seas and to control land-based sources of marine pollution.[120] The latter has become a subject of global concern, raised in part in Agenda 21.[121]

E. ATTENTION TO NONPARTIES

Because the global environmental system ignores political boundaries, it is important for countries that have an impact on the global environment not to remain outside the convention system and defeat the purposes of the agreement. It is necessary to include in international environmental agreements all those states that are essential for the agreement to be effective.

Traditionally, multilateral agreements usually did not include explicit incentives to join an agreement, although there may have been outside pressures to join. In the environmental agreements reached in the last two decades, in contrast, states have increasingly offered incentives in the

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115. *See id.* pmbl., art. 2, 31 I.L.M. at 822, 824 (noting that the conservation of ecosystems and natural habitats is necessary for the conservation of biological diversity, that lack of full scientific certainty should not postpone the implementation of measures, and defining "ecosystem" to include all animal and "micro-organism" communities).

116. Agreement on Great Lakes Water Quality, *supra* note 60.

117. *See id.* pmbl., 30 U.S.T. at 1383, 1384.

118. Protocol Respecting Great Lakes Water Quality, Nov. 18, 1987, U.S.-Can., *reprinted in* WEISS ET AL., *supra* note 1, at 419.

119. *See* Protocol Amending the 1978 Agreement between the United States of America and Canada on Great Lakes Water Quality, Annex 15 (Airborne Toxic Substances), Annex 16 (Pollution from Contaminated Groundwater) Oct. 16, 1983 (on file with *The Georgetown Law Journal*).

120. *See, e.g.,* Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, Jan. 18, 1990, 34 Int'l Envtl. Rep. (BNA) 3261; Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources, May 17, 1980, 19 I.L.M. 869; Protocol for the Protection of the South-East-Pacific Against Pollution From Land-Based Sources, July 23, 1983, UNEP Reg. at 199.

121. *See* Agenda 21, *supra* note 82, at ch. 17, ¶¶ 18-29.

agreement in the form of technical assistance or other positive inducements.[122] The Montreal Protocol, the Climate Framework Convention, and the Biological Diversity Convention provide such incentives as technical assistance, technology transfer, or building national capacity to implement the agreement.[123]

A less common way of providing incentives is the use of negative inducements in the form of a ban on trade in the controlled substances with nonparties. As early as the 1973 Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES),[124] countries recognized that if agreements were to be effective, they needed to ensure that nonparties did not become havens for circumventing the agreement. The CITES agreement limits trade in the covered species with nonparties.[125] This strategy has recently been revived and strengthened in the environmental agreements directed to controlling transboundary shipments of hazardous waste and to preventing ozone layer depletion, both of which include provisions prohibiting trade with nonparties.[126] The Montreal Protocol provisions are punitive because they prohibit the parties from subtracting exports of controlled substances to nonparties from their national consumption calculations of controlled substances.

Parties to the General Agreement on Tariffs and Trade (GATT)[127] are now considering in the GATT Environment Working Group whether the use of negative inducements by limiting trade is consistent with the GATT.

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122. Agreements in other areas have also done this. *See, e.g.,* Treaty on the Non-Proliferation of Nuclear Weapons, July 1, 1968, 21 U.S.T. 483, 729 U.N.T.S. 161. Under the treaty, nuclear weapons states agreed to assist nonnuclear states in the development of peaceful uses of nuclear energy. *Id.* art. v, 21 U.S.T. at 490, 729 U.S.T.S. at 173.

123. *See* Montreal Protocol, *supra* note 30, art. 10, S. TREATY DOC. NO. 10, at 7, 26 I.L.M. at 1557 (calling on parties to cooperate in promoting technical assistance in order to facilitate participation in the Protocol); Framework Convention on Climate Change, *supra* note 43, art. 4(c), 31 I.L.M. at 855 (calling on parties to transfer technology and cooperate in other ways "to reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol"); Convention on Biological Diversity, *supra* note 44, art. 16, ¶ 1, 31 I.L.M. at 829 (calling on parties to facilitate access to and transfer of technologies "that are relevant to the conservation and sustainable use of biological diversity"); *id.* art. 18, ¶ 1, 31 I.L.M. at 829 (requiring parties to "promote international technical and scientific cooperation").

124. CITES, *supra* note 24.

125. *Id.* art. x, 27 U.S.T. at 1104, 993 U.N.T.S. at 251.

126. *See* Montreal Protocol, *supra* note 30, art. 4, S. TREATY DOC. NO. 10, at 5, 26 I.L.M. at 1554-55 (providing that parties shall ban the import of controlled substances from nonparty states); *see also* Basel Convention, *supra* note 39, art. 4, ¶ 5, S. TREATY DOC. NO. 5, at 10, 28 I.L.M. at 662 (providing that parties shall ban the import and export of hazardous wastes from nonparty states).

127. General Agreement on Tariffs and Trade, Oct. 30, 1947, T.I.A.S. No. 1700, 55 U.N.T.S. 187 [hereinafter GATT].

Data on the effectiveness of such a provision in the CITES agreement is scattered and mainly anecdotal, but suggests that the negative inducement trade limitation has had little effect on the behavior of countries.[128] However, because it is easier to monitor trade in ozone depleting chemicals and in hazardous wastes, trade ban provisions relating to these items may prove to be more effective.

Negative inducements in international environmental agreements also address another issue that relates to nonparties: the free-rider problem, in which a state obtains the benefits of the agreement without ever joining and incurring the costs the agreement might impose. For example, a country that declined to join an air pollution agreement or climate convention could receive the benefits of cleaner air or a stabilized climate without incurring the costs of achieving it.[129] Trade prohibitions and positive incentives to join the agreement are also relevant to controlling this phenomenon, and the international community is increasingly recognizing this.

F. PARTICIPATION OF NONGOVERNMENTAL ORGANIZATIONS

Nongovernmental organizations (NGOs) have assumed an increasingly important role in the negotiation, ratification, implementation, and enforcement of international environmental agreements. They are a primary link between the public and national governments; they let individuals try to influence the international environmental agreement process.

The presence of NGOs at official negotiations of international environmental agreements has become routine. At the Climate Convention[130] negotiations, for example, a wide array of NGOs monitored the negotiations, distributed material, lobbied delegations, and otherwise tried to influence the negotiators. Representatives of NGOs also are appearing on official country delegations, as in the negotiations for the Environmental Protocol to the Antarctic Treaty.[131] In the Climate Convention negotiations, an NGO, the Foundation for International Environmental Law and

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128. For a particularly astute analysis of the effects of a CITES ban on elephant ivory trade, see Michael J. Glennon, *Has International Law Failed the Elephant?*, 84 AM. J. INT'L L. 1, 17-22 (1990).

129. The opposite phenomenon could also occur, namely that some countries could control greenhouse gas emissions at great cost and receive little benefit unless other countries that emit large amounts also joined the agreement.

130. Framework Convention on Climate Change, *supra* note 43.

131. *See* Protocol on Environmental Protection to the Treaty Regarding the Antarctic, *supra* note 38, 30 I.L.M. at 1460 (stating that representatives of "international governmental and non-governmental organizations attended the Meeting as observers").

Development based in London, provided advice to a group of island states and served as members of their delegations.[132]

Although NGO participation on official delegations may be increasing, there is not yet widespread acceptance of the practice nor any systematic pattern of representation. For example, the United States delegation to the Organization for Economic Cooperation and Development (OECD) joint meetings of the Trade and Environment Working Groups at first included representation from both environmental NGOs and the business community, but the practice was not sustained.

The process of interaction among NGOs, governments, and intergovernmental organizations is complicated. NGOs try to influence national governments directly and indirectly by increasing public awareness and public pressures on national legislatures. Governments, on the other hand, use NGOs to convey positions to the public. Ministries or agencies within governments may use NGOs to strengthen their views in relation to other parts of the bureaucracy by keeping them well informed about issues and providing venues for them to express their views to various parts of the bureaucracy. NGOs provide intergovernmental organizations with important, independent communication links with national governments; and NGOs rely on intergovernmental organizations to provide information and insights that are useful in influencing national governments.[133]

In a few instances, NGOs have been integrated into the international institutional structure for implementing agreements. Two decades ago in the World Heritage Convention,[134] states gave three NGOs official status in the agreement as advisors and provided that the World Heritage Committee could call upon these organizations "for the implementation of its programmes and projects."[135] The organizations have assumed important roles in evaluating proposed sites for inclusion on the World Heritage List.

III. A CRITIQUE OF INTERNATIONAL ENVIRONMENTAL LAW TODAY

Given the rapid proliferation of international environmental legal instruments and the emergence of rules of customary international law, it is important to examine these efforts critically using an established framework.

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132. At the time, the organization was called the London Centre for International Environmental Law (CIEL). The group of island states is known formally as the Alliance of Small Island States.

133. *See* INSTITUTIONS FOR THE EARTH (Peter M. Haas et al. eds., forthcoming 1993).

134. World Heritage Convention, *supra* note 26.

135. *Id.* art. 13, ¶ 7, 27 U.S.T. at 44, 1037 U.N.T.S. at 157; *see also id.* art. 8, ¶ 3, 27 U.S.T. at 42, 1037 U.N.T.S. at 155, & art. 14, ¶ 2, 27 U.S.T. at 44, 1037 U.N.T.S. at 157-58 (providing for advisory roles for the International Centre for the Study of the Preservation and the Restoration of Cultural Property, the International Council of Monuments and Sites, and the International Union for Conservation of Nature and Natural Resources).

Countries are devoting considerable time and financial resources to the negotiation of legal instruments. Are the instruments effective, efficient, and equitable? Are they adequate to the tasks for which they were negotiated? These are the issues addressed below.

A. EFFECTIVENESS

Although countries have become skilled in negotiating international agreements, they are still much less skilled at making the agreements operate effectively. Some of the problems of effectiveness arise immediately after the agreement is negotiated. While countries may now be able to negotiate complicated environmental agreements in less than two years, the normal period between the time that negotiations are concluded and the agreements enter into force is likely to be three or more years.[136] This means that it is important to accelerate the process of ratification and provide interim or provisional measures that will enable the parties to further the objectives of the convention even before it comes into effect.[137] Ratification could be accelerated by providing assistance to countries, as needed, in translating treaty texts, preparing commentaries for legislative and other decisionmaking bodies, assisting in the preparation of implementing legislation or regulations, and providing important background information to decisionmakers.[138] Both intergovernmental and nongovernmental organizations could undertake such projects to facilitate ratification.

Implementation and compliance with agreements at the national level involves a dynamic, several-stage process with important feedback loops. As an initial step, lawyers correctly ask whether there is a need for national legislation or regulations to implement the agreement, and whether such national measures on their face fully correspond to the obligations assumed under the convention. But this is only one part of the process. Even if these measures technically fulfill the obligations under the agree-

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136. *See, e.g.,* Basel Convention, *supra* note 39 (concluded in March 1989, but not entered into force until May 1992). The Montreal Protocol, *supra* note 30, is a notable exception to this general practice. The Protocol was concluded in September 1987 and entered into force in January 1989. The Amendments to the Protocol were concluded in June 1990 and entered into force in August 1992.

137. For a discussion of issues related to delayed entry into force, see PETER H. SAND, LESSONS LEARNED IN GLOBAL ENVIRONMENTAL GOVERNANCE (1990). The new Climate Convention provides a special article on interim arrangements, Article 21, which addresses issues of an interim secretariat, interim scientific advice, and interim financial arrangements. Framework Convention on Climate Change, *supra* note 43, art. 21, 31 I.L.M. at 870. Some of the concern with interim arrangements relates to how the convention can be made effective before the parties have agreed on particular modalities.

138. *See* Paul C. Szasz, *International Norm-making, in* ENVIRONMENTAL CHANGE AND INTERNATIONAL LAW: NEW CHALLENGES AND DIMENSIONS 41 (Edith Brown Weiss ed., 1992).

ment, if governments, industries, or other private actors do not comply with such measures, the agreement cannot be effective. It is important to determine whether the targeted behavior is being changed in response to the agreement. This process of compliance is dynamic; compliance likely becomes more effective over time.[139]

Sadly we have little data on the successful implementation and overall effectiveness of international environmental agreements. There have been two notable governmental efforts to address this question: the United States Government Accounting Office, which concluded that the agreements they examined were not well monitored for effectiveness,[140] and the intergovernmental report prepared for the United Nations Conference on Environment and Development, which provided a broad overview of agreements and identified several specific problems.[141] The small number of legal studies that have been done on national implementation of particular agreements, which have focused primarily on the Convention on Trade in Endangered Species,[142] have not been based on systematic empirical research, although they have yielded insights into the difficulties of implementing agreements.[143] Thus, there is an urgent need for further empirical research to determine whether, as Professor Louis Henkin has declared for public international law generally, "almost all nations observe almost all principles of international law and almost all of their obligations almost

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139. There is an emerging literature on compliance with international environmental agreements. *See, e.g.*, Kenneth Hanf & Arild Underal, Domesticating International Commitments: Linking National and International DecisionMaking (July 1991) (on file with author); Abram Chayes & Antonia H. Chayes, On Compliance (1992) (on file with author); Ronald Bruce Mitchell, From Paper to Practice: Improving Environmental Treaty Compliance (doctoral dissertation chapter, on file with author) (study of compliance with the London Convention for the Prevention of Pollution by Ships). *See generally* ORAN R. YOUNG, COMPLIANCE AND PUBLIC AUTHORITY: A THEORY WITH INTERNATIONAL APPLICATIONS (1979); Jesse H. Ausubel & David G. Victor, *Verification of International Environmental Agreements*, 17 ANN. REV. ENERGY ENV'T 1 (1992).

140. *See generally* U.S. GENERAL ACCOUNTING OFFICE, GAO/RECD 92-43, INTERNATIONAL ENVIRONMENT: INTERNATIONAL AGREEMENTS ARE NOT WELL MONITORED (1992); *see also* U.S. GENERAL ACCOUNTING OFFICE, GAO/RECD 92-188, INTERNATIONAL ENVIRONMENTAL AGREEMENTS (1992).

141. *Preparatory Comm. for the U.N. Conference on Environment and Development, Survey of Existing Agreements and Instruments and its Follow-up*, U.N. GAOR, 4th Sess., Agenda Item 2, U.N. Doc. A/Conf. 151/PC/WG.III/L.32 (1992) [hereinafter UNCED]. The summary and the background papers have been published in THE EFFECTIVENESS OF INTERNATIONAL ENVIRONMENTAL AGREEMENTS (Peter H. Sand ed., 1992).

142. CITES, *supra* note 24.

143. *See generally* Kathryn Fuller et al., *Wildlife Trade Law Implementation in Developing Countries: The Experience in Latin America*, 5 B.U. INT'L L.J. 289 (1987); Laura Kosloff & Mark Trexler, *The Convention on International Trade in Endangered Species: Enforcement Theory and Practice in the United States*, 5 B.U. INT'L L.J. 327 (1987); Eric McFadden, *Asian Compliance with CITES: Problems and Prospects*, 5 B.U. INT'L L.J. 311 (1987).

all of the time."[144] Data is needed on implementation and compliance with both binding and nonbinding (soft law) legal instruments.

Making agreements effective, specifically at the national and local levels, should be a high priority of the international community; consequently it is important to identify the factors that influence compliance at the national and subnational levels. These factors include: a country's economic and social culture, as well as the structure and operation of its bureaucracy and communication among these bureaucracies; the availability of technical expertise and local technical capacity; ready access to information; the role of nongovernmental organizations; the functions and powers of the secretariat established by the agreement; whether the country participated in the negotiation of the agreement; the influence of other parties to the convention; the incentives in the agreement to encourage compliance; and the provisions for monitoring and reviewing country performance under the agreement.[145] By increasing our understanding of the compliance process and the impact of these factors, we should be able to structure agreements, follow-up measures, and assistance so as to enhance the likelihood of more effective implementation and compliance.[146]

B. EFFICIENCY: THE TREATY CONGESTION PROBLEM

Because the international community will always have limited resources to address difficult issues, it is important that the system of negotiating, monitoring, implementing, and complying with international environmental agreements function relatively efficiently. Ironically, the success that countries have had in negotiating a large number of new international environmental agreements has led to an important and potentially negative side effect: treaty congestion. This affects the international community as a whole, particularly international institutions, as well as individual governments that may want to participate in the negotiation and implementation of agreements but have scarce professional resources.[147]

One of the characteristics of the treaty congestion problem is operational inefficiency. It is not yet clear that we will be able to make the new

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144. LOUIS HENKIN, HOW NATIONS BEHAVE 47 (1979).

145. *See* Harold K. Jacobson & Edith Brown Weiss, Implementing and Complying with International Environmental Accords: A Framework for Research (American Political Science Association, 1990) (unpublished manuscript, on file with *The Georgetown Law Journal*).

146. Under the auspices of the Social Science Research Council, a multidisciplinary international team of scholars has begun an empirical study of national implementation of and compliance with five international environmental agreements in nine countries. The International Institute of Applied Systems Analysis in Laxenburg, Austria held a small workshop on the subject in October 1992 and has proposed a major initiative in this area.

147. This does not necessarily mean that we should slow down the process for developing international norms; rather it means that we must try to make the process more efficient and manageable for all countries.

system of international agreements function efficiently. Moreover, efficient operation is, in part, a function of risk assessment and presently there is no generally accepted system for assessing risks, and even more importantly, none for prioritizing them.

The transaction costs in negotiating international agreements are high. A normal negotiation may require four or five intergovernmental negotiating sessions of one to two weeks each during a period of eighteen months to two years. The Climate Convention negotiations required six sessions of two weeks each in less than sixteen months, in addition to regular meetings of the Intergovernmental Panel on Climate Change and various other informal meetings involving subsets of countries. Despite this very full and expensive schedule of negotiations, the Climate Convention negotiations were only one of more than a half dozen global or regional environmental agreement negotiations occurring more or less at the same time. During this period there were also important international negotiations for the conclusion of nonbinding legal instruments, such as the Arctic Protection Strategy,[148] the Rio Declaration on Environment and Development,[149] Forest Principles,[150] and Agenda 21.[151]

Many countries, especially those with limited resources, have complained about the demands these negotiations place on them for staffing and funding in order to participate in the negotiations. While the industrialized countries have provided some assistance to developing countries to participate in certain negotiations, such as the Climate Convention, such assistance has been insufficient to allow many developing countries to participate with fully staffed delegations, or sometimes to participate at all in particular sessions.

Moreover, the international community has not developed a systematic process for coordinating the negotiations. As Sir Geoffrey Palmer notes,

> The making and negotiation of the instruments themselves has to start anew each time. No organization commands clear power to coordinate international environmental negotiations. Each negotiation proceeds differently. . . . Such an approach carries the grave risk that on each occasion the wheel must be reinvented. Common elements are not necessarily treated the same way.[152]

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148. Arctic Environmental Protection Strategy, *supra* note 46.

149. Rio Declaration on Environment and Development, June 13, 1992, 31 I.L.M. 874 [hereinafter Rio Declaration].

150. Forest Principles, *supra* note 45.

151. Agenda 21, *supra* note 82.

152. Geoffrey Palmer, *New Ways to Make International Environmental Law,* 86 AM. J. INT'L L. 259, 263 (1992).

The opposite problem also arises from treaty congestion—the tendency to take language from one treaty and transfer it to another because it has already received clearances from home governments, even though a different approach, or different language, might be more appropriate. There is sometimes little attention devoted to examining anew what the best approach or language might be for the special circumstances in the agreement under negotiation.

To induce coordination in the system, Palmer proposes a common institutional home for international environmental agreements.[153] But whether it would necessarily be efficient to have such a centralized arrangement is questionable; it would depend in good part on the efficiency of the structure and the operations in the institutional home. It may be possible to induce greater efficiency into the present system through more effective and widespread use of advances in information technology and other coordination measures.

With such a large number of international agreements, there is great potential for the additional inefficiency of overlapping provisions in agreements, inconsistencies in obligations, significant gaps in coverage, and duplication of goals and responsibilities. This issue was recognized during the simultaneous negotiations for the climate[154] and biological diversity conventions[155] and forest principles.[156] All three legal instruments, for example, affect the management of forests. Informal efforts were made to ensure that the obligations were consistent with each other. In particular, the Convention on Biological Diversity addresses the issue of consistency with other agreements explicitly, by including a separate article entitled "Relationship with Other International Conventions."[157]

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153. *Id.* at 264. The United Nations Environmental Programme, for example, might be designated as the home for international environmental agreements, which would mean that the secretariats would be located there.

154. Framework Convention on Climate Change, *supra* note 43.

155. Convention on Biological Diversity, *supra* note 44.

156. Forest Principles, *supra* note 45.

157. Convention on Biological Diversity, *supra* note 44, art. 22, 31 I.L.M. at 832. This article provides that the Convention does not affect the rights and obligations of state parties to other international agreements, "except where the exercise of those rights and obligations would cause a serious damage or threat to biological diversity." *Id.* The article further provides that the Convention is to be implemented consistently with the Convention on the Law of the Sea. *Id.* The Basel Convention addresses the relationship of the global convention to regional and bilateral agreements. Article 11 stipulates that parties may enter into regional and bilateral agreements provided that the provisions are "not less environmentally sound than those provided for by this Convention in particular taking into account the interests of developing countries." Basel Convention, *supra* note 39, art. 11, 28 I.L.M. at 668. If countries have already entered into such agreements at the time they become parties to the Basel Convention, the provisions of the Convention do not affect movements of waste pursuant to these agreements "provided that such agreements are compatible with the

In still other cases, issues arise that require analyzing the intersection between provisions of different agreements, such as those between the London Ocean Dumping Convention[158] and the Basel Convention on Controlling Transboundary Shipments of Hazardous Waste.[159] Both Conventions address the use and shipment of hazardous wastes that may be ultimately intended for marine disposal. Similarly, there are important legal questions arising from the intersection of the Antarctic Treaty[160] and the Law of the Sea Convention.[161] The intersection of issues is likely to become more frequent as countries conclude ever increasing numbers of agreements, which must be interpreted in conjunction with existing international obligations.

Treaty congestion has also created significant inefficiencies in implementing international agreements. Normally there are separate secretariats, monitoring processes, meetings of parties, sources of scientific advice and presentation of scientific material, financing mechanisms, technical assistance programs, and dispute resolution procedures for each treaty. At a minimum there is a need for coordination of agreements. Agenda 21,[162] which was prepared for the U.N. Conference on Environment and Development, suggests the colocation of secretariats.[163] While this may be desirable, housing the secretariats under one jurisdictional roof does not necessarily guarantee coordination. Although several agreements are located in the United Nations Environment Programme (UNEP), the secretariats are not located in the same place, nor is there necessarily greater coordination as a result of housing the agreement under one jurisdictional roof. It may be possible to address the coordination problem at the international level in a less centralized way, at least initially, by encouraging regular meetings of secretariats or by increasing use of the rapid advances in information technology. The information revolution can assist by making communication easier and less costly and by facilitating the gathering, analysis, and dissemination of data.

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environmentally sound management of hazardous wastes and other wastes as required by this Convention." *Id.*

158. London Ocean Dumping Convention, *supra* note 25, art. I, 26 U.S.T. at 2406, 1046 U.N.T.S. at 140.

159. Basel Convention, *supra* note 39.

160. Treaty Respecting the Antarctic, *supra* note 38.

161. Convention on the Law of the Sea, *supra* note 75. The 1982 Law of the Sea Convention is not in force because it has not been ratified by the required number of countries. However, the United States has claimed that most of its provisions, with the notable exception of the seabed provisions, constitute customary international law, so the intersection of the two agreements is still a timely issue.

162. Agenda 21, *supra* note 82.

163. *See id.*

As we look to the future, it is evident that more needs to be done to mitigate the inefficiencies in implementing international agreements. In the provisions for financing implementation of the agreements, industrialized countries favor making the Global Environmental Facility (GEF),[164] located at the World Bank, the funding mechanism for new international environmental agreements, in particular for the climate and biological diversity conventions. This proposal, which would promote efficiency, has encountered strong opposition from developing countries who argue it is inequitable unless the governing structure of the GEF is altered to give them a substantial voice in the Facility.[165] Others are wary of the concentration of power this would bring. This particular conflict highlights the larger equity versus efficiency dilemma, which is both ancient and widespread throughout national and international legal systems.[166] This dilemma will likely arise repeatedly as countries attempt to bring greater efficiency into the current system of implementing international environmental agreements.

Finally, treaty congestion leads to overload at the national level in implementing the international agreements. A country needs sufficient

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164. The Global Environmental Facility (GEF) was established to fund projects on global warming, pollution of international waters, destruction of biological diversity, and depletion of the ozone layer. It is a three-year experiment administered by the World Bank that provides grants for investment projects, technical assistance, and to a lesser extent, research to assist developing countries in protecting the global environment and to transfer environmentally safe technologies to them. Countries with per capita income of less than $4000 a year (as of October 1969) are eligible.

The GEF is an umbrella for three distinct funds: the so-called "core fund" or global environmental trust fund (GET); the associated cofinancing arrangements, which are available on grant or highly concessionary terms; and the Montreal Protocol Fund to help developing countries comply with the provisions of the Protocol. The Montreal Protocol Fund, while under the umbrella of the GEF, is administered separately from the other two by the United Nations Environment Programme under the auspices of a 14 country executive committee.

The World Bank, U.N. Development Programme (UNDP), and the UNEP have coresponsibility for the GEF. The World Bank administers the Facility, acts as the repository of the Trust Fund, and is responsible for investment projects. The UNDP provides technical assistance, helps identify projects, and will run the small-grants program for NGOs. The UNEP provides the secretariat for the Scientific and Technical Advisory Panel to the GEF and provides environmental expertise.

165. The Framework Convention on Climate Change designates the Global Environmental Facility (GEF) to serve as the financial mechanism on an interim basis and notes that the GEF "should be appropriately restructured and its membership made universal to enable it to fulfill the requirement of Article 11 (Financial Mechanism)." Framework Convention on Climate Change, *supra* note 43, art. 21, 31 I.L.M. at 870. The failure to designate the GEF as the interim financial mechanism in the Convention on Biological Diversity was indicated as one of the principal points of concern to the United States when it considered whether to sign the agreement.

166. *See generally* A. Dan Tarlock, *Environmental Protection: The Potential Misfit Between Equity and Efficiency*, 63 U. COLO. L. REV. 871 (1992).

political, administrative, and economic capacity to be able to implement agreements effectively. Today a large number of international environmental institutions, including most pointedly the numerous secretariats servicing international environmental agreements, have some claim on the administrative capacity of national states. Even industrialized states with well-developed regulatory mechanisms and bureaucracies show signs of being overwhelmed. As attention shifts to the importance of implementing and complying with the agreements that have been negotiated, this burden on the administrative capacity of states will become even more acute. Attention must be given to developing local capacity within countries to implement and comply with international environmental agreements effectively and efficiently. New technologies will be useful, but cannot substitute for other capacity-building measures, such as the training of personnel, development of economic resources, and restructuring of institutions for accountability.

C. EQUITY: THE SOURCE OF CONFLICT

Increasingly, notions of equity or fairness are the focus of pointed conflict in the negotiation and implementation of international environmental instruments. For equity to have meaning, it must be defined. The traditional notion of equity that has formed the basis of numerous environmental accords is one of national sovereign rights to exploit resources within a country's jurisdiction or control, combined with rights to shared or common resources (whether for natural resources or for pollution emissions) on a first-come, first-served basis. However, this traditional equity ethic has been deteriorating, and a new ethic is in the process of emerging. The search for a consensus on a new definition of equity is likely to be one of the major factors shaping international environmental accords in the future.

The controversy over the definition of equity lay at the heart of the U.N. Conference on Environment and Development debates. The Rio Declaration on Environment and Development,[167] a nonbinding legal instrument, explicitly reflects this concern with equity. Among other things, the Principles of the Declaration address obligations intended to "decrease the disparities in standards of living and better meet the needs of the majority of the people of the world";[168] provide for priority treatment to "the special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable";[169] and recognize that "[i]n view of the different contributions to global environmental

167. Rio Declaration, *supra* note 149.
168. *Id.* princ. 5, 31 I.L.M. at 877.
169. *Id.* princ. 6, 31 I.L.M. at 877.

degradation, States have common but differentiated responsibilities."[170] By contrast, twenty years earlier the U.N. Stockholm Declaration on the Human Environment[171] referred only to the need to consider "the systems of values prevailing in each country and the extent of the applicability of standards which are valid for the most advanced countries but which may be inappropriate and of unwarranted social cost for the developing countries,"[172] and, as was also expressed in the Rio Declaration, the need for financial and technical assistance.[173]

In international environmental law, the two issues that have given definition to equity are the allocation of natural resources and the responsibility and liability for pollution. Both have traditionally been based on rights acquired on a first-come, first-served basis, subject to increasing demands for equitable sharing of the burden of conserving natural resources and controlling pollution.

The right of countries to control the exploitation and use of natural resources within their own jurisdiction or control has been repeatedly reaffirmed in international legal instruments.[174] Traditionally states have also claimed the right to exploit resources outside national borders in commonly held areas on the basis of a first-come, first-served ethic in the absence of agreement to the contrary. This method of exploiting resources is reflected in the initial allocations of the geostationary orbit, the radio frequency spectrum, international waterways, fisheries, marine mammals, birds, and ocean mineral resources. Most international agreements have at least implicitly started from this ethical presumption. Countries have then voluntarily agreed to constraints on their operational behavior affecting these shared or common resources. The two notable international

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170. *Id.* princ. 7, 31 I.L.M. at 877.

171. Declaration of the United Nations Conference on the Human Environment, June 16, 1972, 11 I.L.M. 1416 [hereinafter Stockholm Declaration].

172. *Id.* princ. 23, 11 I.L.M. at 1420.

173. *Id.* princ. 12, 11 I.L.M. at 1419. The Rio Declaration deliberately does not use the term "technical assistance," which some countries view as unnecessarily narrow in scope and possibly condescending. Rather, the relevant article focuses on cooperation and provides that "[s]tates should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific understanding . . . and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies." Rio Declaration, *supra* note 149, princ. 9, 31 I.L.M. at 877.

174. For example, Principle 21 of the Stockholm Declaration on the Human Environment begins by explaining that "states have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies." Stockholm Declaration, *supra* note 171, princ. 21, 11 I.L.M. at 1420. The Rio Declaration repeats this statement in Principle 2, and adds "and developmental" to environmental policies. Rio Declaration, *supra* note 149. The Stockholm principle has been commonly regarded as reflecting customary international law, and hence being binding on all states. Stockholm Declaration, *supra* note 171, princ. 21, 11 I.L.M. at 1420.

agreements that did not begin with this first-come, first-served presumption, but rather started from a notion of shared responsibility for the resources at issue, are the Convention on the Law of the Sea[175] and the Wellington Convention on Antarctic Mineral Resources,[176] both of which resulted in complicated allocation schemes that have never gone into effect. Increasingly, however, areas once considered to be *res nullius* or belonging to no one are treated as part of the "global commons."

The second primary focus of international environmental legal instruments has been on controlling pollution. Again, states have traditionally asserted the right to pollute at self-determined levels. International instruments have limited these rights. In practice this has meant that states that were able to industrialize first, or those that have vast territories, have been able to establish pollution levels quite independently of other countries.

In instances of transborder pollution, states have the responsibility under Principle 21 of the Stockholm Declaration to ensure that "activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction."[177] But increasingly the effects of pollution are felt on a regional basis, which means that more detailed, regionally-focused control arrangements are needed. Countries have found it difficult to reach consensus on the base line year for establishing acceptable pollution levels. The problem is that countries that are beginning to industrialize and trying to reach parity with more industrialized countries do not want to be burdened with an early base line year, and those industrialized countries that have already started controlling pollution want to receive appropriate credit in the selection of the base line year. In the regional context of the U.N.-ECE, the concern is not only with equitably allocating acceptable levels of pollution for those countries that are still industrializing, but also

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175. *See* Convention on the Law of the Sea, *supra* note 75, Part XI, 21 I.L.M. at 1293 (chapter on seabed minerals).

176. Convention on the Regulation of Antarctic Mineral Resource Activities, June 2, 1988, 27 I.L.M. 859 [hereinafter Wellington Convention]. The Wellington Convention will be shelved for at least fifty years when the new Protocol on Environmental Protection to the Antarctic Treaty enters into force. The Antarctic Environmental Protocol prohibits any activity related to mineral resources, except for scientific research; the prohibition can only be lifted by the parties after fifty years if "there is in force a binding legal regime on Antarctic mineral resource activities that includes an agreed means for determining whether, and, if so, under which conditions, any such activities would be acceptable." Protocol on Environmental Protection to the Antarctic Treaty, Oct. 4, 1991, arts. 7, 25, 30 I.L.M. 1455, 1470.

177. Stockholm Declaration, *supra* note 171, princ. 21, 11 I.L.M. at 1420.

with treating equitably those countries that have already reduced pollution levels significantly in advance of the target base year.[178]

The equity issues that are most controversial in the international community concern responsibility for the prevention of harm to global resources and liability for their damage. The Rio Declaration addresses these issues in its reference to "common but differentiated responsibilities" arising from "the different contributions to global environmental degradation,"[179] and in its concern with liability issues and the polluter pays approach in internalizing environmental costs.[180]

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178. The negotiations for the U.N.-ECE protocols controlling sulphur dioxide and nitrogen oxide reflected this. The United States has never joined the Protocol on Sulphur Dioxide, in part because of concern that it would not be given appropriate credit for the reductions it had made prior to the conclusion of the Protocol. 1985 Helsinki Protocol, *supra* note 31. *See* Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution Concerning the Control of Emissions of Nitrogen Oxides or Their Transboundary Fluxes, Oct. 31, 1988, 28 I.L.M. 214 (1989), to which the United States did become a party.

179. Rio Declaration, *supra* note 149, princ. 7, 31 I.L.M. at 877. This principle was formulated initially with the belief that the developed countries should have the "main responsibility" for combatting pollution because they have contributed the most to pollution. The initial draft of the Rio Declaration by the Group of 77, an informal group of developing countries, contained a principle entitled "Main Responsibility." This principle declared:

> The major historical and current cause of the continuing deterioration of the global environment is the unsustainable pattern of production and consumption, particularly in developed countries. Thus, the responsibility for containing, reducing and eliminating global environmental damage must be borne by the countries causing such damage, must be in relation to the damage caused and must be in accordance with their respective responsibilities.

Moritaka Hayashi, Differentiated Responsibilities of "Unequal" Parties to International Environmental Agreements, Paper presented at the Conference on Environmental Inequality, Harvard University (Nov. 14, 1992) (on file with *The Georgetown Law Journal*). Hayashi argues that the principle of common but differentiated responsibilities is accompanied by the "concept of different obligations," by which he means that states with less capacity to fulfill an agreement are accorded special treatment, as in the ten-year delay period for compliance with the Montreal Protocol, and those states with greater capacities have the duty to assist those in the former group. *Id.* at 3-4.

180. Rio Declaration, *supra* note 149, princs. 13 & 16, 31 I.L.M. at 878-79. The Rio Declaration prudently treats the question of liability in a separate principle from the polluter-pays approach and appropriately refers to the polluter pays as an approach rather than as a principle. Within the international legal and policy community, there have been efforts to promote the polluter-pays approach as a principle of legal liability. The problem is that the principle of polluter pays was developed to ascribe responsibilities of individual firms to "bear the expenses of carrying out the [pollution control] measures . . . . [and reflect them] in the cost of the goods or services which cause pollution." Recommendation of the Council on the Implementation of the Polluter-Pays Principle, Nov. 14, 1974, 14 I.L.M. 234. This is not appropriate as a principle of liability between states, nor was it intended as such. Liability in international law has been traditionally concerned with compensating for damage, although it is nearly impossible to compensate states fully for environmental damage. Moreover, if the goal of those who argue for a polluter-pays liability principle is to discourage polluting behavior, the amount needed to deter such behavior is unlikely to be the same as that needed to compensate for damage. Moreover, the polluter-pays principle

The controversial issues in defining equity with regard to pollution control are multiple: whether to establish common or differentiated pollution control standards (as in the per capita chemicals consumption base line standard for developing countries in the Montreal Protocol[181]), what flexibility there should be in the time frame for meeting standards (as in the ten year delay permitted for developing countries in meeting Montreal Protocol chemical phase-out requirements[182]), the extent to which countries should be held responsible for activities that contributed to global environmental degradation in the past (for example, liability for effects of ozone depletion on inhabitants of the southern hemisphere), the extent to which a group of countries should be held responsible to particular countries who may suffer harm tomorrow from actions taken globally today (for example, the claims of island countries that industrialized countries establish a trust fund today to cover the costs of the rise of ocean levels due to global warming tomorrow), and the more general question of the responsibility of the present generation to future generations for the care and use of the planet.[183]

In developing a new definition of equity for environmentally sustainable development, several factors and issues must be noted and addressed. First, the global environment knows no political boundaries; its components are spatially and temporally interdependent. This means that no one country or even group of countries has the capability to protect the environment over time by its own isolated efforts. Consequently, there is an incentive for all countries to reach consensus on an equitable and effective basis for allocating responsibility for maintaining the planet.

Second, developing countries have control over resources that are important to the industrialized world, just as the industrialized world has always

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as an economic approach suggests that a party could be liable only for negligent behavior, not strictly liable, in international law. Finally, the emphasis on liability is questionable. There is virtually no instance in public international law when states have admitted liability for environmental damage to another country in the absence of treaty provisions. Indeed the trend has been directly opposite—some countries have paid for the installation of proper pollution control in polluting countries because the costs of doing so were less than the costs of continuing to suffer pollution damage. *See* Edith Brown Weiss, Remarks, World Climate Change—Greenhouse Effect, *in* 84 AMERICAN SOCIETY OF INTERNATIONAL LAW, PROCEEDINGS OF THE ANNUAL MEETING 356, 359-60 (1990).

181. Montreal Protocol, *supra* note 30, art. 5, S. TREATY DOC. NO. 10, at 1555, 26 I.L.M. at 1555.

182. *Id.*

183. For presentation and analysis of issues of intergenerational equity, see EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY (1989). For legal analysis of equity issues and developing countries, see Daniel Barstow Magraw, *Legal Treatment of Developing Countries: Differential, Contextual, and Absolute Norms,* 1 COLO. J. ENVTL. L. & POL'Y 69 (1990); Cheng Zheng-Kang, *Equity, Special Considerations, and the Third World,* 1 COLO. J. ENVTL. L. & POL'Y 57 (1990).

had control over resources needed by the developing world. The debates during the Biological Diversity Convention reflect this fact; the developing countries realized that the best reserves of biological diversity lie within their boundaries. In some ways this gave them bargaining power in the negotiations.

Third, developing countries are likely to suffer most from environmental degradation. This is both because poverty is a primary source of environmental degradation and because when rapid, human-induced global environmental change occurs, these countries have the least capacity to adapt.

Finally, future generations are, in my view, becoming a party to debates about equity. Sustainable development is inherently intergenerational, as are the agreements we negotiate. Yet future generations' interests have not been identified and adequately represented in the negotiations, the implementing measures, or in the compliance mechanisms of international environmental agreements. The present generation obviously has a built-in bias in favor of itself. Indeed the instruments that we have developed in the marketplace to consider environmental effects on future generations, namely externalities and discount rates, start from the perspective of the present generation. Thus, as we consider the future, it will be important to develop an international consensus on the definition and outlines of the concept of intergenerational equity.

IV. EMERGING DIRECTIONS IN WORLD ENVIRONMENTAL LAW AND ORDER

In June 1992, 178 countries met in Rio de Janeiro, Brazil, for the United Nations Conference on Environment and Development, which was the twentieth anniversary of the United Nations Stockholm Conference on the Human Environment. The Rio Conference was an occasion to consider how far we had come in the last twenty years, and how far we need to go in the next twenty. As we look ahead to the future, it is clear that new directions in the environmental world order are emerging. These trends can be categorized both in immediate, and somewhat narrow terms, and in long-range, broader terms.

A. THE IMMEDIATE TRENDS

In the next two decades, the joining of environmental protection and economic development will grow. The burgeoning new field of environment and trade reflects this linkage. While trade law has operated under the relatively unified and broad framework of the General Agreement on Tariffs and Trade[184] for more than forty years, fledgling international

184. GATT, *supra* note 127.

environmental law still consists only of many separate and disparate legal instruments. It is not surprising then that most environment and trade issues are discussed almost exclusively within the GATT context. The environment and trade issues move in two directions: environmental protection practices affect trade, and trading practices affect environmental conservation. Thus, it will be important to move to a *modus vivendi* in which environmental and trade concerns are accorded comparable legitimacy, and both are viewed as important elements of sustainable development.[185]

More generally, in the quest for environmentally sustainable development, the focus will likely move to considering environmental concerns at the front end of the industrializing process, so as to prevent pollution, minimize environmental degradation, and use resources more efficiently. This should mean an increasing concern with making the whole system of production environmentally sound. If so, international environmental law will reflect this emphasis by focusing on standards and procedures for preventing pollution and minimizing environmental degradation, rather than on liability for damage, and on providing incentives to companies to use environmentally sound processes.

Second, the formulation of nonbinding legal instruments, or "soft law," is likely to increase more rapidly than the negotiation of formal international conventions. This is because when the instrument is nonbinding, agreement is normally easier to achieve, the transaction costs are less, the opportunity for detailed strategies to be set forth are greater, and the ability to respond to rapid changes in our scientific understanding of environment and development issues are more vast.

Third, the growing adoption of new approaches, duties, and procedures in international environmental accords is likely to continue. These include the precautionary principle or approach and the duties to consult with affected states, to prepare an environmental impact assessment before undertaking certain projects, to provide emergency assistance for environmental accidents or disasters, to monitor activities, and to make relevant information available.

Finally, UNCED[186] and the 1992 Rio Declaration[187] may be viewed as legitimizing the importance of public participation in environmental deci-

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185. *See generally* Edith Brown Weiss, *Environment and Trade as Partners in Sustainable Development: A Commentary,* 86 AM. J. INT'L L. 728 (1992). For an analysis of environmental issues in the context of trade law, see John H. Jackson, *World Trade Rules and Environmental Policies: Congruence or Conflict?,* 49 WASH. & LEE L. REV. 1227 (1992); Thomas J. Schoenbaum, *Free International Trade and Protection of the Environment: Irreconcilable Conflict?,* 86 AM. J. INT'L L. 700 (1992).

186. UNCED, *supra* note 141.

187. Rio Declaration, *supra* note 149, princ. 10, 31 I.L.M. at 878.

sionmaking and of public access to relevant information.[188] The international institutional system in which environmental legal instruments are imbedded is likely to continue to become more diverse and to include increasingly larger numbers of nongovernmental organizations of various kinds. While four decades ago we could speak of an international system focused almost exclusively on nation-states and their subunits, today the system includes national governments (and local governments), intergovernmental organizations, and nongovernmental organizations as essential components constantly interacting. NGOs are likely to continue to expand their influence in the negotiation, implementation, and compliance process of international environmental legal agreements. The information revolution should greatly facilitate this increased role of NGOs in international environmental decisionmaking.[189]

B. THE BROADER PERSPECTIVE

The concept of national interest, which has long been used to address foreign policy decisions, is not a very useful construct for analyzing global environmental problems in the long-term.[190] National interest can be defined as national preferences, or the preferences of a country's decisionmakers. On the global scale these interests are often considered in terms of a zero-sum gain. The implicit assumption is that one country's national interest is necessarily opposed to another's. But when addressing global environmental issues the interest is a common one: the overall maintenance of the world's environmental systems. This becomes apparent as we look into the future because no community today can by itself conserve the planet for even its own descendants.

The physical setting in which all peoples are locked together in a common global environment for the foreseeable future means that it is increasingly futile to posit national interests that over the long term can be opposed to another country's national interest in the environment. The rapid advances in international cooperation, as demonstrated in international environmental law, suggest countries are implicitly beginning to recognize this need to coordinate long-term interests.

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188. Principle 10 provides in part that "[e]nvironmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information." *Id.*

189. While the information revolution offers a powerful tool for ensuring global environmental health and for empowering the public, it may also promote fragmentation and make management more difficult. In some cases, governments may find it more challenging to address problems in the face of the information revolution because widely disparate groups will have access to powerful information technologies to persuade constituencies, whom once persuaded, may be hard to change.

190. For an excellent overview of different attitudes toward the general validity of national interest, see STEPHEN D. KRASNER, DEFENDING THE NATIONAL INTEREST 1-30 (1978).

The international environmental agreements negotiated during the last two decades reflect a commonality of interests. In many international legal instruments, states have agreed to constrain "operational sovereignty,"[191] while continuing to retain formal national sovereignty. The conventions on ozone depletion, transboundary shipments of hazardous waste, air pollutants such as nitrogen oxides and volatile organic chemicals, and the Antarctic environment illustrate this constraint. In other agreements, states have arguably strengthened their operational sovereignty by focusing on national plans and actions and dissemination of these documents to other parties to the agreements. The recent Framework Convention on Climate Change and the Convention on Biological Diversity reflect this approach. Nonetheless in these instances, states have set up an international process for monitoring the health of the environment and for providing other benefits to parties. In the climate change convention, the international procedures are sophisticated and far-reaching,[192] and they could lead to substantial international consideration and evaluation of national measures to mitigate climate change. Thus, the international environmental agreements examined in this article point in the same direction—a recognition of the benefits of international cooperation and an increased willingness to agree to obligations directed to protecting the environment.

While countries may share a commonality of interests in maintaining the robustness and integrity of our planet, there are deep differences among them over the equitable allocation of burdens and benefits in doing so. These were vividly displayed at the Rio Conference meeting and are reflected in more recent agreements. Moreover, states do not agree on priorities—whether to satisfy immediate needs to alleviate poverty and local environmental degradation or longer-term needs to protect the robustness and integrity of the biosphere. The clashes extend to communities and groups at the local and transnational levels. These clashes could intensify in the next two decades, as countries (and communities) try to reach consensus on what is equitable in the context of environmentally sustainable development. Unless resolved, they could lead to inefficient and ineffective outcomes that are inadequate to the task of conserving our global environment and ensuring sustainable development for future generations.

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191. INSTITUTIONS FOR THE EARTH, *supra* note 133, at 21. Lynton Caldwell notes that states have in some instances agreed to modify their asserted freedom to act as they please in relation to their natural resources, industrial practices, and the environment. LYNTON CALDWELL, INTERNATIONAL ENVIRONMENTAL POLICY: EMERGENCE AND DIMENSIONS 311 (2d ed. 1990). Internationally agreed limits on pollution and use of natural resources constrain operational sovereignty.

192. Framework Convention on Climate Change, *supra* note 43, art. 4, 31 I.L.M. at 855-59.