

DEVELOPING COUNTRIES AND OZONE LAYER PROTECTION: ISSUES, PRINCIPLES AND IMPLICATIONS

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Developing countries (otherwise known as less developed countries or LDCs) are playing an increasingly significant role in global environmental protection. This article analyzes the newly-established ozone layer protection regime, focusing on the ways it addresses the special needs and interests of developing countries. Through this focus, the article tries to illuminate some of the general concepts and issues of international environmental law. Reflecting on some of the recent developments in global environmental negotiations (particularly the Earth Summit in Rio de Janeiro), the article concludes that the ozone experience will serve as a paradigm for future environmental regimes.

I. SCIENTIFIC AND HISTORICAL BACKGROUND

Terms such as "stratospheric ozone depletion" and "chlorofluorocarbon" (CFC), which were purely scientific jargons until the mid-1980s, have quickly found their way into the daily language. Despite continuing scientific uncertainty surrounding the phenomenon of ozone depletion,¹ it is now

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1. One of the most important lessons the ozone experience has taught us is that global environmental harm arising from modern human activities tends to be slow and barely perceptible. Protective measures must be taken before damage becomes tangible and irremediable. Lack of scientific certainty should not be an excuse for environmental inaction. As Richard Elliot Benedick, the chief U.S. ozone negotiator, aptly put it: "If we are to err in designing measures to protect the ozone layer, then let us, conscious of our responsibility for future generations, err on the side of caution." RICHARD E. BENEDICK, *OZONE DIPLOMACY* 3-4 (1991). See also The Rio Declaration on Environment and

known that stratospheric ozone, created out of the net result of some complicated chemical and dynamic processes in which ozone molecules are created photochemically from diatomic oxygen (O_2) and destroyed by a series of complex chemical reactions involving oxygen, hydrogen, nitrogen, chlorine, and bromine, absorbs ultraviolet (UV) radiation in the 280 - 300 nm wavelength range, as well as varying amounts of infrared radiation.² Increased ultraviolet radiation that results from ozone depletion is believed to be responsible for increases in the incidence of skin cancer and suppression of human immune responses.³ Adverse impacts on the natural environment include the following: Reduced crop yields, increased mortality of commercially or ecologically important aquatic life, degradation of paints, plastics and other materials, and potentially significant climactic changes.⁴

F.S. Rowland and M.J. Molina, atmospheric scientists of the University of California at Davis, speculated as early as 1974 that CFCs would remain in the atmosphere for long periods and would react with and destroy ozone molecules.⁵ CFCs, first developed by the DuPont Company and the General Motors Corporation in the 1930s,⁶ have been widely used since World War II. Inexpensive, nonflammable and non-toxic in nature, CFCs are used as coolants in refrigeration and air conditioning, propellants in aerosol spray, solvents in electronics, agents in

Development, June 14, 1992, princ. 15, *reprinted in* Text of Earth Summit's Rio Declaration, REUTERS, June 14, 1992, *available in* LEXIS, Nexis Library, LBYP File [hereinafter Rio Declaration]; United Nations Draft Convention on Biological Diversity (May 22, 1992 draft), pmbl., *reprinted in* 15 Int'l Env't Rep. (BNA) 372 (1992) [hereinafter Biological Diversity Convention].

2. *Environmental Assessment of the Vienna Convention for the Protection of the Ozone Layer*, in Vienna Convention for the Protection of the Ozone Layer, Mar. 22, 1985, 26 I.L.M. 1516, 1524 (1987) [hereinafter *Environmental Assessment of the Vienna Convention*].

3. See, e.g., *Vienna Convention for the Protection of the Ozone Layer: Letter of Submittal*, U.S. State Department to the U.S. President, in Vienna Convention for the Protection of the Ozone Layer, Mar. 22, 1985, 26 I.L.M. 1516, 1518 (1987) [hereinafter *Vienna Convention Letter of Submittal*]. (For every 10% ozone decrease, there would be 300,000 extra skin cancer cases and 1,750,000 extra cataract cases. One hundred and fifty thousand persons would become blind for every 1% ozone depletion); *Greenpeace Says Ozone Hole over Britain Could Be Eminent, Urges Action*, 15 Int'l Env'tl. Rep. (BNA) 95 (1992).

4. See *Environmental Assessment of the Vienna Convention*, *supra* note 2, at 1524; *Vienna Convention Letter of Submittal*, *supra* note 3, at 1518.

5. Mario J. Molina & F. S. Rowland, *Stratospheric Sink for Chlorofluoromethane: Chlorine Atomic-Catalyzed Destruction of Ozone*, 249 NATURE 810, 812 (1974).

6. See Philip Shabecoff, *Industry Acts to Save Ozone*, N.Y. TIMES, Mar. 21, 1988, at A15.

medical equipment sterilization, and components in producing plastic foam and computer chips.⁷ Due to their unusually stable nature, CFCs, when released into the atmosphere, are not broken down in the troposphere, but rather they ascend slowly into the stratosphere,⁸ where they destroy ozone molecules. Ninety percent of CFCs, by estimate, still remain in the troposphere, with the implication that ozone depletion will extend far beyond this generation even if CFC use ceases immediately.⁹

Scientific observation in recent years has revealed an appalling picture of stratospheric ozone loss. With anthropogenic trace gases that deplete ozone increasing at a rapid rate on the global scale, there has been a large, sudden and unexpected decrease in the abundance of spring-time Antarctic ozone over the last decade. While this notorious Antarctic ozone hole keeps expanding, measurable ozone depletion occurs in other areas of both hemispheres.¹⁰ By the end of the 1980s, the international community reached the consensus that drastic control measures must be taken before ozone depletion could inflict a devastating impact on the human environment.

International action to combat ozone layer depletion began in the late 1970s.¹¹ In March 1977, experts from governments, intergovernmental organizations and nongovernmental organi-

7. See Timothy C. Faries, *Clearing the Air: An Examination of International Law on the Protection of the Ozone Layer*, 28 ALBERTA L. REV. 818, 821 (1990). (In the U.S., 40% of CFCs are used in refrigeration and air conditioning and 20% in electronics). Andrew Pollack, *Moving Fast to Protect Ozone Layer*, N.Y. TIMES, May 15, 1991, at D11. Halons, another major culprit for ozone destruction, are used in fire extinguishers, but less often. See Dale S. Bryk, *The Montreal Protocol and Recent Developments to Protect the Ozone Layer*, 15 HARV. ENVTL. L. REV. 275, 277 (1991).

8. It takes seven to ten years for CFCs to move from the troposphere to the stratosphere. See Peter M. Lawrence, *International Legal Regulation for Protection of the Ozone Layer: Some Problems of Implementation*, 2 J. ENVTL. L. 17, 18 (1990).

9. Even if CFC use ceases today, stratospheric chlorine (the main ozone killer released from CFCs) will further increase to seven times its natural stock. Bryk, *supra* note 7, at 277-78.

10. Joel A. Mintz, *Progress Toward a Healthy Sky: An Assessment of the London Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer*, 16 YALE J. INT'L L. 571, 574-78 (1990). The study shows a significant ozone decline over the Northern Hemisphere in the last two decades (1.7 - 3% for the range of 30 to 60 degrees north latitude during the period of 1969-86). Loss of ozone in the Southern Hemisphere has been most active in springtime over Antarctica and also spreads into wider areas with reduction throughout the year (5% or more decrease at all latitudes south of 60 degrees throughout the year since 1979). See Philip Shabecoff, *Study Shows Significant Decline in Ozone Layer*, N.Y. TIMES, Mar. 16, 1988, at A25.

11. For a detailed account of the history of ozone negotiations, see BENEDICK, *supra* note 1.

zations (NGOs) met in Washington and drew up a World Plan of Action on the Ozone Layer, which recommended intensive international research and monitoring of the situation and granted the United Nations Environment Program (UNEP) central responsibility for promoting research and gathering relevant data.¹² The World Plan of Action also created the Co-ordinating Committee on the Ozone Layer in order to coordinate, initiate and review research.¹³ In May 1981, the Governing Council of UNEP decided to initiate elaboration of a global framework convention for ozone layer protection and created the Ad Hoc Working Group of Legal and Technical Experts for its preparation.¹⁴ After five sessions (with seven meetings) where tough debates occurred between the European Community (EC) countries on one side and the United States, Canada and the Scandinavian countries on the other,¹⁵ the Ad Hoc Working Group presented a fifth revised draft convention with technical annexes in January 1985.¹⁶ The Vienna Convention for the Protection of the Ozone Layer (Vienna Convention) was adopted on March 22, 1985 at a Conference of Plenipotentiaries on the Protection of the Ozone Layer held in Vienna.¹⁷ The Vienna Convention set out as its general objective the protection of human health and the environment against the adverse effects of human activities that modify the ozone layer.¹⁸ Without laying down specific control measures, it called for cooperation in systematic observation, research and information exchange. The Convention, however, did set up a Conference of the Parties which were empowered to adopt protocols and amendments to the Convention.¹⁹ The Vienna Conference also requested that the Executive Director of UNEP create a working group to work on a proto-

12. *World Plan of Action on the Ozone Layer*, UNEP/WG/7/25/Rev. 1, annex 3 (1977).

13. *Id.* For a survey of international action leading to the Vienna Convention, see Iwona Rummel-Bulska, *The Protection of the Ozone Layer under the Global Framework Convention*, in *TRANSBOUNDARY AIR POLLUTION* 281 (C. Flinterman, et al. eds., 1986).

14. *Governing Council Decision* 9/13B of May 26, 1981.

15. The controversies were focused on control measures as to which the EC supported a limitation on general production capacity. The U.S. favored differential variations of a gradual phaseout (for example, 80% reduction of CFC use in aerosols within 8 years).

16. UNEP/IG. 53/3.

17. See Vienna Convention for the Protection of the Ozone Layer, available in 26 I.L.M. 1516, 1529-40 (1987).

18. *Id.* at art. 2, para. 1.

19. *Id.* at arts. 6, 8 & 9.

col based on achievements of the Ad Hoc Working Group.²⁰ The Ad Hoc Working Group for the Preparation of a Protocol on the Chlorofluorocarbons to the Vienna Convention for the Protection of the Ozone Layer (the Vienna Group) began its first session in December 1986 and, following intense debates,²¹ successfully prepared the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol).²² The Protocol was adopted on September 16, 1987 at a Conference of Plenipotentiaries in Montreal.

The Montreal Protocol laid down specific control measures to reduce the use of ozone-depleting chemicals. Under the Protocol, state parties agreed, with certain exceptions, to reduce their consumption and production of CFCs to fifty percent of the base year (1986) figure by the end of the century.²³ The parties also agreed to freeze their consumption and production of halons at the base year level.²⁴ To encourage states to accede to the Protocol, trade with non-parties in controlled substances and, prospectively, products containing and produced with the substances, were largely banned or restricted.²⁵ The Protocol also provided for procedures to adopt further adjustments and amendments.²⁶

It was during and after the negotiations of the Montreal Protocol that the special roles and needs of developing countries came into focus. The ozone depletion crisis, by its very nature, calls for cooperative action by the whole global community since ozone-depleting chemicals, when discharged into the air, can cause damage to the ozone layer far away from their original emitting spot, thus rendering any localized control efforts ineffective. Currently, the developing countries make up only a small portion of global CFC consumption and production,²⁷ but

20. *Id.* at 1523.

21. The Vienna Group focused on: (1) an actual reduction formula, (2) the inclusion of a trade ban, and (3) the accommodation of the needs of developing countries. See JUTTA BRUNNEE, *ACID RAIN AND OZONE LAYER DEPLETION: INTERNATIONAL LAW AND REGULATION* 236-42 (1988).

22. Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, reprinted in 26 I.L.M. 1541 (1987) [hereinafter *Montreal Protocol*].

23. *Id.* at art. 2, paras. 1, 3 & 4.

24. *Id.* at para. 2.

25. *Id.* at art. 4.

26. *Id.* at art. 2, para. 9, art. 6, art. 11, para. 4.

27. Developing countries, with 75% of the world population, account for less than 15% of global CFC production and consumption. The 35% of the world's population that reside in China and India consume less than 3% of the world's CFCs. See James T.B.

their potential CFC use is considered to be enormous.²⁸ According to one estimate, two percent of stratospheric ozone would be depleted by 2050 if every country freezes its CFC use at the present level, but six to ten percent of ozone would be lost by 2050 if developed countries reduce their CFC use by twenty to fifty percent and developing countries increase their use by twenty-five percent annually up to 0.5 kilograms per capita.²⁹ Universal participation, particularly the participation by the vast majority of developing countries in the ozone protection regime, is crucially important for the success of any ozone depletion abatement program.³⁰

The special needs and interests of developing countries had been a subject of debate throughout the Montreal Protocol negotiations, but most developing countries did not participate in the process until the Montreal Conference began, by which time the agenda had been set and only specific details were discussed.³¹ The Montreal Protocol referred to "special provisions" required to meet the needs of developing countries³² and laid down different obligations for the developing countries. The Protocol also, in general language, called for facilitation of technical and financial assistance to developing countries.³³ The developing countries were generally dissatisfied with the inadequacy of these arrangements.³⁴ By the end of 1989, China and India, the two largest developing countries, had made it clear that they would not accede to the Montreal Protocol unless technical and financial aid to developing countries were assured and a special fund-

Tripp, *The UNEP Montreal Protocol: Industrialized and Developing Countries Sharing the Responsibility for Protecting the Stratospheric Ozone Layer*, 20 N.Y.U. J. INT'L L. & POL. 733, 743-44 (1988).

28. Without control, developing countries could double their share of global CFC consumption to 30% by 2000. Rene Bowser, *A History of the Montreal Protocol's Ozone Fund*, INT'L ENVTL. DAILY (BNA) (Dec. 5, 1991), available in LEXIS, Nexis Library, BNAIED File.

29. UNEP/WG.167/INF.1, Apr. 24, 1987.

30. The point was reflected in a Resolution on the Montreal Protocol at the Montreal Conference, which urged all states to become parties to the Vienna Convention and the Montreal Protocol. Protocol on Substances That Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1544, 1548 (1987).

31. BENEDICK, *supra* note 1, at 93.

32. Montreal Protocol, *supra* note 22, at preamble.

33. These provisions will be discussed in sections III and IV *infra*.

34. A Malaysian negotiator, for example, characterized the Montreal Protocol as "inequitable." BENEDICK, *supra* note 1, at 99-101. By August 1989, only 14 developing countries had ratified the Montreal Protocol, while almost all developed countries had done so. *Id.* at 151.

ing mechanism was created for that purpose.³⁵ In addition, the need to revise the Montreal Protocol became inevitable when overwhelming scientific evidence revealed the severity and urgency of the ozone crisis, which, in turn, triggered greater public discontent over the modest control measures laid down in the Protocol.³⁶

In June 1990, ninety-six nations, of which fifty-eight were developing countries, attended the Second Meeting of the Parties to the Montreal Protocol in London. The main objective of the meeting was to make financial resources and technology available to the LDCs in order to allow them to participate effectively in the ozone regime.³⁷ The Meeting finally adopted several adjustments and amendments to the Montreal Protocol.³⁸ Under the London Amendments, consumption and production of CFCs and halons will be phased out by the end of this century.³⁹ Several other chemicals were also put under control and will be phased out either by 2000 or 2005.⁴⁰ Differential treatment for developing countries under the Montreal Protocol was reaffirmed and expanded, and a Multilateral Fund was established to provide financial assistance to developing countries.⁴¹ Provisions regarding transfer of technology were revised and strengthened to some extent.⁴² A non-compliance procedure was adopted on an interim basis. (These provisions will be discussed in sections III, IV and V.) In sum, the London Amendments provided strong incentives for developing countries to join in international cooperation efforts to protect the ozone layer and effectively strengthen the ozone regime. Characterized by Mostafa Tolba, the Executive Director of UNEP, as "a prece-

35. At the London Conference to Save the Ozone Layer in March 1989, China and India called it unacceptable for developing countries to either forgo their food preservation and air conditioning needs (essential for raising living standards) or to pay more for CFC substitutes, which would enrich the very chemical industries that had created the CFC problem in the first place. *Id.* at 123-26.

36. Mintz, *supra* note 10, at 574-78.

37. Report of the Second Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, UNEP/OzL. Pro. 2/3, June 29, 1990, at 1 [hereinafter *London Report*].

38. Adjustments and Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer, June 29, 1990, 30 I.L.M. 539 (1991) [hereinafter *London Amendments*].

39. *Id.* at annex I.

40. *Id.* at annex II, art. 1, §§ K-M.

41. *Id.* at § T.

42. *Id.* at § U.

dent-setting bargain,"⁴³ the London Amendments set up a milestone in the development of international environmental law.

The following sections of the article will begin with some general concepts involved in the relationship of developing countries vis-a-vis global environmental protection and will then discuss various aspects of the ozone regime that are significant to developing countries.

II. DUTIES, ENTITLEMENT AND EQUITY

Growing concerns over developing countries and special considerations for them have been increasingly emphasized in international environmental lawmaking in response to the needs of this peculiar group of nations. By the time of the United Nations Conference on the Human Environment of 1972, the attitudes of the LDCs towards the appeal from the West for environmental protection had been indifferent and skeptical.⁴⁴ Global environmental protection was typically characterized as "a rich men's problem, a rich men's solution."⁴⁵ The reasons for this early environmental coldness (which in some cases continues to exist today) were manifold, but the profound desire of the LDCs for economic development lay at the very root of this attitude.

The needs of LDCs for economic growth should be fully understood as a starting point in approaching global environmental problems. The distribution of wealth between industrialized states and LDCs is, at present, deplorably disproportionate. The Third World countries, holding three-fourths of the global population, enjoy only 30% of the world's income,⁴⁶ while the North consumes 70% of the world's energy, 75% of its metal, 85% of its wood and 60% of its food.⁴⁷ The income gap is still widening.⁴⁸ In a world where the United States spends more on

43. *Parties to the Montreal Protocol Agree to Phase out CFCs, Help Developing Nations*, 13 Int'l Env'tl. Rep. (BNA) 275 (1990).

44. See A.K. Biswas, *Environment and Law: A Perspective from Developing Countries*, WORKSHOP: THE FUTURE OF THE INTERNATIONAL LAW OF THE ENVIRONMENT 389, 393 (1985).

45. Elizabeth P. Barratt-Brown, *Building a Monitoring and Compliance Regime under the Montreal Protocol*, 16 YALE J. INT'L L. 519, 534 (1991). See also ALEXANDRE KISS & DINAH SHELTON, *INTERNATIONAL ENVIRONMENTAL LAW* 48-49 (1991).

46. KISS & SHELTON, *supra*, note 45, at 48.

47. Larry B. Stammer, *It's North vs South at Summit*, L.A. TIMES, May 25, 1992, at A26.

48. The per capita income difference between the world's richest 20% of the population and the poorest 20% has increased 150 fold over the past two decades. *Id.*

dieting than the Philippines' total budget for health,⁴⁹ the LDCs, not surprisingly, consider development as their top priority and believe discussion of poverty to be the "central point in any discussion of the environment."⁵⁰ The developing countries were concerned that new environmental safeguards would divert their limited economic resources, thus inhibiting their rate of growth. Trade disadvantages were also feared due to the fact that strict environmental regulation in developed countries (such as extensive recycling or efficient use of raw materials, as well as regulation of agricultural imports against high pesticide concentration or heavy metal contamination) might affect the export potentials or trading patterns of LDCs and that countries enforcing more stringent environmental standards would incur higher production costs than those who cared less about the environment. LDCs were also worried about development assistance being channelled into international environmental projects.⁵¹ As one commentator points out, there exists a "hierarchy of human needs" in developing countries by which needs for food, clothing and shelter take priority over social and aesthetic needs. Accordingly, marginal utility of environmental protection, compared with that of economic growth, turns out to be much smaller in LDCs than in developed countries.⁵² Thus, the developing countries often have appeared hostile toward what they perceive as "anti-development attitude with regard to the environment"⁵³ and fear "recolonization through environmental conditionalities."⁵⁴ The equity factor, discussed below, together with the reluctance of some developed nations to pursue stringent environmental protection also contributed to the

49. Tom Kenwarthy, *Saving Plant and Animal Life: Treaty on Biological Diversity Offers Opportunity for Breakthrough*, WASH. POST, June 1, 1992, at A15.

50. Charles Petit, *Earth Summit May Focus on Aid*, S.F. CHRON., May 15, 1992, at A5. See statements by Kamal Nath, the Indian Environment Minister in Jonathan Thatcher, *Asian Poor Tell the Rich to Help Fix the Planet*, REUTERS, May 29, 1992, available in LEXIS, Nexis Library, LBYRPT File.

51. See Biswas, *supra* note 44, at 390-91; BRUNNEE, *supra* note 21, at 68-69.

52. See BRUNNEE, *supra* note 21, at 67-70.

53. Thatcher, *supra* note 50 (statement by Emil Salim, the Indonesian Environment and Population Minister).

54. See statement by Tariq Osman Hyder, the Pakistani chief negotiator for the Group of 77 in Paul Lewis, *Environmental Aid for Poor Nations Approved at U.N.*, N.Y. TIMES, Apr. 5, 1992, at 1. In the ozone negotiation, with India asserting that developed countries "usurped" India's opportunity to develop CFCs, the LDCs unequivocally opposed imposition of conditions on provisions addressing their needs. Bryk, *supra* note 7, at 291-92.

environmental inactivity of the LDCs.⁵⁵

The traditional issue of sovereignty is another question often raised. The General Assembly Resolution 2849 (XXVI), entitled "Development and Environment," uttered a classic definition on that matter, stating that "every country has the right to formulate, in accordance with its own particular situation and in full enjoyment of its national sovereignty, its own natural policies on the human environment, including criteria for evaluation of projects."⁵⁶ Sovereignty has often been pleaded against international efforts to regulate national environmental policies.⁵⁷ It appears for now that the developing countries accept a distinction between natural resources that are clearly shared by the world at large (for example, the atmosphere and the ocean) and can thus be subject to international regulation, and those which fall within national territories.⁵⁸ However, even with regard to the latter category of resources, national discretion is still subject to rules of general international law, including the principle of *sic utere tuo ut alienum non laedas* [one should use his own property in such a manner as not to injure that of another], as well as any evolving principles of a soft law nature governing the particular subject matter.⁵⁹ The Rio Declaration on Environment and Development reiterates the principle of the Stockholm Declaration of 1972⁶⁰ and integrates national sovereignty rights

55. See *infra* text accompanying notes 68-81; see also Julia Preston & Eugene Robinson, *National Interests Preside at Rio: Rhetoric of Global Cooperation Does Not Suffuse Back Rooms*, WASH. POST, June 7, 1992, at A28.

56. U.N. General Assembly Res. 2849 (XXVI), *Development and Environment*, Jan. 17, 1992, U.N. Doc. A/RES/2849(XXVI), reprinted in 11 I.L.M. 422, 423 (1972).

57. For example, Jose Sarney, Brazilian President, accused international concern over the Amazon forests of becoming "attempts of intimidation, to explicit and veiled threats that even question the principle of sovereignty of states." James Brooke, *Brazil Wants Foreign Aid to Fight Pollution, But No Strings*, N.Y. TIMES, Mar. 31, 1989, at A9.

A recent debate of interest concerned the protection of biological diversity. France and Sweden led industrialized countries in advocating that a global list of areas and species to be protected by the Biological Diversity Convention be retained in the Convention, while the India-led LDCs insisted on its removal, arguing that it encroached upon national sovereignty. The LDCs considered it unacceptable to allow foreign nations to determine what kind of resources in their territories need to be protected. See Manohar Esipisu, *U.N. Begins Crisis Talks to Rescue Planet Treaty*, REUTERS, May 21, 1992, available in LEXIS, Nexis Library, LBYRPT File. The list was finally dropped. See Jane Perlez, *98 Nations Adopt Biological Treaty; U.S. May Not Sign*, N.Y. TIMES, May 21, 1992, at A1, 5.

58. See Preston & Robinson, *supra* note 55.

59. During the negotiations preceding the United Nations Conference on Environment and Development (UNCED), attempts at making a binding treaty on forests were struck down and a "statement of principles" was sought, instead. *Id.*

60. United Nations Conference on the Human Environment, June 16, 1972, 11 I.L.M. 1416, 1420 (1972) [hereinafter Stockholm Declaration].

with international responsibility towards the environment. It declares 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 and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.⁶¹

Since the 1972 Stockholm Conference, a consensus has gradually emerged among states that environmental degradation is detrimental to the economic development and well-being of peoples throughout the world, and environmental protection and improvement is the duty of all nations.⁶² National jurisdiction should not preclude environmental regulation in the international sphere, as environmental concerns are becoming a common concern of mankind.⁶³ This is particularly true with regard to ozone layer depletion and global warming. Environmental protection and rational management of resources will in the long run also be economically beneficial to the developing countries since an expensive environmental crisis can eventually be avoided and because prevention is generally less costly than the remedy.⁶⁴ Sustainable development, by which development behavior will preserve the natural resource base on which it is undertaken, is crucial for Third World countries. To achieve sustainable development, environmental protection "shall constitute an integral part of the development process and cannot be considered in isolation from it."⁶⁵

61. Rio Declaration, *supra* note 1, princ. 2. See also Latin American and Caribbean Summit Declaration of Brasilia on the Environment, Mar. 31, 1989, 28 I.L.M. 1308, 1311 (1989) [hereinafter Declaration of Brasilia].

62. Stockholm Declaration, *supra* note 60, at pmbl.

63. See U.N. General Assembly Resolution on Protection of Global Climate for Present and Future Generations of Mankind, U.N. Doc. A/RES/43/53, Dec. 16, 1988, reprinted in 28 I.L.M. 1326, 1327 (1989); Biological Diversity Convention, *supra* note 1, at pmbl. See also Gunther Handl, Remarks at the Eighty-third Annual Meeting of the American Society of International Law, in INTERNATIONAL LAW AND PROTECTION OF THE ATMOSPHERE 63-64 (1989).

64. See BRUNNEE, *supra* note 21, at 69-70. Ozone layer depletion will eventually have worse effects on LDCs than developed countries. LDC's poorer sanitary conditions and medical facilities may lead to more severe human physical harm; productivity decline in agriculture and fishery will devastate the economies of many LDCs; tropical countries, mostly LDCs, are more vulnerable to solar damage to materials, buildings and paints. BENEDICK, *supra* note 1, at 151-52.

65. Rio Declaration, *supra* note 1, princ. 4. See also *id.* princ. 8.

However, economic underdevelopment and the lack of financial, technical and administrative capability to deal with environmental problems have produced most of the pollution symptoms in the LDCs.⁶⁶ Poverty has become a toxic force itself, and environmental policies, on the one hand, ought to enhance—and not adversely affect—present or future development potential of the LDCs.⁶⁷ On the other hand, environmentally unsound development damages the ecological base on which long-term capacity for sustainable development rests. Acknowledging that obliteration of poverty is an indispensable requirement for sustainable development in LDCs⁶⁸ requires that a balance must be carefully struck between development patterns and environmental policies.⁶⁹ It is amid the tension between development and the environment that equity considerations come into play,⁷⁰ and from which additional entitlements of the LDCs derive.

Most of the environmental problems having a global impact today have been caused primarily by environmentally unsound and poorly coordinated industrialization, consumption and disposal patterns in the *developed countries*.⁷¹ The twenty-four Organization for Economic Cooperation and Development (OECD) member states, accounting for 16% of the world's population, are responsible for 43% of the world's fossil fuel use, 46% of metal use, 65% of paper and cardboard use, 65% of sulfur oxide pollution and 54% of nitrous oxide pollution.⁷²

66. See G.A. Res. 2849, *supra* note 56, at 423. In addition, the governments in developing countries are subject to enormous pressure for rapid short-term economic growth, often at the expense of environmental defacement. Daniel B. Magraw, *Legal Treatment of Developing Countries: Differential, Contextual and Absolute Norms*, 1 COLO. J. INT'L ENVTL. L. & POL'Y 69, 69-71 (1989).

67. Stockholm Declaration, *supra* note 60, princ. 11, 1419.

68. Rio Declaration, *supra* note at 1, princ. 5. See also The Amazon Declaration, May 6, 1989, reprinted in 28 I.L.M. 1303, 1304 (1989); Declaration of Brasilia, *supra* note 61, at 1312.

69. See Gunther Handl, *Environmental Protection and Development in Third World Countries: Common Destiny—Common Responsibility*, 20 N.Y.U. J. INT'L L. & POL. 603, 607-08 (1988).

70. Resort to equity in an international community where no common belief in natural law stands may be nothing but use of acceptable justiciable rules of thumb and pragmatic reconciliation of conflicting interests out of every relevant consideration. See Martti Koskenniemi, *Peaceful Settlement of Environmental Disputes*, 60 NORDIC J. INT'L L. 73, 81 (1991).

71. G.A. Res. 2849, *supra* note 56, at 423; Declaration of Brasilia *supra* note 61, para. 12, at 1313.

72. Paul Overberg, *Environmental Issues Split Northern, Southern Hemispheres*, GANNETT NEWS SERVICE, May 21, 1992, available in LEXIS, Nexis Library, GNS File.

Figures regarding CFC emission are even more alarming: developed countries, which make up 25% of the world's population, account for 85% of global CFC production and consumption. Per capita CFC use in China, Egypt and Mexico are 0.02, 0.06 and 0.07 kilograms respectively, while the same figure for Japan, the U.S. and the EC are 0.48, 0.84, and 0.85 kilograms respectively.⁷³ While it is true that the polluting effects of industrialization were unknown until very recently, the developed countries from an equitable standpoint bear *special* responsibility to international efforts for environmental protection. This special responsibility is twofold.

First, the primary responsibility of industrialized nations for causing the environmental crisis, together with their vast assumption of the world's economic wealth, calls for them to take primary responsibility commensurate with their share of global financial and technological resources, in taking initial, concrete and significant steps to reverse the environmental deterioration.⁷⁴ These measures are particularly imperative to get the developing countries on board environmental regimes, since it would be clearly inequitable to expect the nations having a disproportionately smaller share of the world's resources to bear the burden for a crisis caused primarily by the rich countries.⁷⁵ In terms of equitable international environmental lawmaking, the developed countries must bear the heavier treaty obligations, implement stricter control measures over shorter periods of

73. Tripp, *supra* note 27, at 743-44. Each American produces nine times as much greenhouse gas as each Chinese. Sheryl WuDunn, *Difficult Algebra for China: Coal = Growth = Pollution*, N.Y. TIMES, May 25, 1992, at A1.

74. See Declaration of Brasilia, *supra* note 61, at 1313. The Rio Declaration, *supra* note 1, princ. 7, affirms that

In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and the technologies and financial resources they command.

Id.

The Hague Declaration on the Environment, Mar. 11, 1989, 28 I.L.M. 1308, 1309 (1989) [hereinafter Hague Declaration], signed by 24 states, also sets forth, that: "Most of the emissions that affect the atmosphere at present originate in the industrialized nations. And it is in these same nations that the room for change is greatest, and these nations are also those which have the greatest resources to deal with this problem effectively."

75. See Pamela Wexler, *Protecting the Global Atmosphere Beyond the Montreal Protocol*, 14 MD. J. INT'L L. & TRADE 1, 18 (1990); see also Stammer, *supra* note 47 (statement by German Garcia Duran, Ambassador to Colombia).

time, and have less access to defenses for noncompliance than the LDCs.

Second, as the international community as a whole strives for the salvation of the Earth from ecological destruction, the developed countries bear special obligations to assist the LDCs, both financially and technologically, in adopting protective and corrective measures in favor of the global environment and converting their industrialization processes to environmentally sound practices.⁷⁶ The developing countries, whose livelihood and well-being will be significantly endangered by the environmental deterioration,⁷⁷ but who played only a marginal role in contributing to the crisis, have both the moral and the legal entitlement to receive assistance and compensation for the opportunity costs incurred by choosing development options which favor the global environment.⁷⁸ For many decades the advancement of national economies in developed countries have benefited from the unknown external costs of environmental crisis. Had the problem of ozone depletion been discovered a century ago, the costs involved in CFC phaseout today would have been internalized in the production costs of the CFC-related industries in all the developed countries.⁷⁹ The North earned a kind of hidden subsidization at the expense of degrading the pollution-carrying capacity of the world's eco-systems, while building economic and trade domination over the South. The costs which they are now obliged to disburse merely represent belated repayment of the debts that they should have paid long ago. The developing countries whose development options are preempted by the North's environmental contamination, are now being asked to share the burden without deriving any of the socio-economic benefits enjoyed over time by the North.⁸⁰ The entitlement of the LDCs to environmental compensation is simply a device to restore fairly to the South the same development

76. See Stockholm Declaration, *supra* note 60, princ. 12, at 1419; Nairobi Declaration on the State of Worldwide Environment, May 18, 1982, 21 I.L.M. 676, 677 (1982); Hague Declaration, *supra* note 74, at 1309; G.A. Res. 2849, *supra* note 56, at 423.

77. See BRUNNEE *supra* note 21, at 69-70.

78. Gunther Handl, *International Efforts to Protect the Global Atmosphere: A Case of Too Little, Too Late?*, 1 EUR. J. INT'L L. 250, 256 (1990); Handl, *supra* note 63, at 65.

79. Sanford E. Gaines, *The Polluter-Pays Principle: From Economic Equity to Environmental Ethos*, 26 TEX. INT'L L.J. 463, 494-95 (1991).

80. *Id.* See also Handl, *supra* note 78, at 252-53; Gunther Handl, *Environmental Security and Global Change: The Challenge to International Law*, 1 Y.B. INT'L ENVTL. L. 3, 29 (1990).

opportunities the North enjoyed many decades ago.⁸¹

Aside from the entitlement consideration, the LDCs, as a practical matter, are only able to comply with international environmental standards when outside financial and technical assistance is provided to them. Correspondingly, recent international environmental lawmaking has provided an equitable quid pro quo link between the LDCs' compliance with their obligations and the availability of financial and technical aid, provided primarily from developed countries.⁸² With the general recognition that economic growth is the top objective for the developing countries, the problem of channelling financial and technical aid to them for the sake of sustainable development is now becoming the *pivotal* issue of international environmental diplomacy.⁸³ State practices in the past several years have indicated a crystallization of soft law principles into a customary legal entitlement for LDCs to claim aid from developed countries for their endeavors to preserve global environmental resources.⁸⁴ This entitlement, however, operates at the level of general international law, and specific treaty provisions and mechanisms are needed to address specific subject areas.

81. See Gaines, *supra* note 79, at 494.

82. See *infra* text accompanying notes 179-81.

83. This, however, has yet to be appreciated by the whole public. One recent news story, for example, with an ill-informed survey of China's environmental policy, asserts that "the crucial question environmentalists are asking is, Will China be willing to curb the country's release of threatening gases, even at the possible cost of economic growth?" WuDunn, *supra* note 73.

84. Highlights of the accumulating state practice in this connection include: (1) numerous international resolutions and declarations (see declarations cited *supra* note 76); (2) numerous international conventions (see conventions cited *supra* notes 22, 37); the United Nations Convention on the Law of the Sea, arts. 202, 203, December 10, 1982, 21 I.L.M. 1261, 1323-24 (1982); Basel Convention on the Control of Transboundary Movement of Hazardous Waste and Their Disposal, March 22, 1989, pmbl., 28 I.L.M. 649, 658 (1989); United Nations Convention on Climate Change (May 8 draft), art. 4, para. 3, 5, reprinted in 15 Int'l Envtl. Rep. (BNA) 314 (1992) [hereinafter Climate Change Convention]; Biological Diversity Convention, *supra* note 1, at pmbl.; (3) other bilateral and multilateral arrangements including the various international debt forgiveness schemes, debt-for-nature swaps and the creation and working of the Global Environment Facility. See Handl, *supra* note 80, at 29-30. Perhaps of special significance for evidentiary purposes is the acceptance of responsibility by the developed countries themselves, as manifested in their concurrence to and participation in the above-cited declarations, conventions and arrangements. Other examples include the Group of Seven Communiqué following the Paris summit of 1989 and their acceptance of responsibility during the ozone negotiations. BENEDICK, *supra* note 1, at 152-53. The non-binding nature *per se* of some individual documents and declarations should not preempt their accumulative evidentiary effect in the formative process of customary law. See Oscar Schachter, *International Law in Theory and Practice*, 178 R.C.A.D.I. 9, 114-21 (1982-V).

III. ASYMMETRICAL TREATMENTS

One of the most remarkable features of modern multilateral environmental treaties is in their tendency to lay down differential rights and obligations for different groups of states. Traditionally, international agreements established symmetrical rights and duties among state parties, both as a token of sovereign equality principles and as a corollary to the parties' *reciprocal* self-interests. The multilateral conventions that regulate global environmentally-sensitive resources and call for universal participation, differ from traditional international agreements in that global community interests are at stake while the parties' self-interests are remote. Also, these conventions address behaviors within the parties' territories that used to be considered purely domestic matters.⁸⁵ On the one hand, sharp differences in financial and technological capabilities and in the repercussions of regulations upon prospective national economic development between developed nations and developing countries render the establishment of asymmetrical rights and duties necessary. On the other hand, equitable considerations with regard to proportional contributions to the environmental crisis form the moral rationale of asymmetrical treatment.

Sensitive to the harms environmental regulations may cause to their development potential, in the early 1970s the developing countries, while not disputing the general principles that they agreed to, argued that environmental standards and criteria should be defined at the national level and asserted that those environmental rules suited only to advanced countries were not applicable to them.⁸⁶ While this attitude seems to nullify the whole concept of international environmental law, it highlighted the fact that environmental conventions should not be made on the traditional symmetrical basis. To be sure, asymmetrical treatment of state parties to multilateral treaties is not novel to international lawyers. Many constituent instruments of international organizations confer special representation or voting privileges to certain members or groups of members, usually to the "big guys" in the relevant areas.⁸⁷ However, while it is true that

85. See Rudiger Wolfrum, *Purposes and Principles of International Environmental Law*, 33 GERMAN Y.B. INT'L L. 308, 327 (1990).

86. See G.A. Res. 2849, *supra* note 56, at 403; Stockholm Declaration, *supra* note 60, princ. 23, at 1420.

87. Among them, the most notorious one is certainly Article 27 of the U.N. Charter which endows veto power to the five permanent members of the Security Council. The four

almost any type of distinguishing criterion may become the basis for asymmetrical treatment,⁸⁸ unsoundly-founded asymmetrical standard-setting that deviates from the dogma of sovereign equality and risks a form of discrimination, will tend to jeopardize the credibility and effectiveness of the regime.⁸⁹ Furthermore, asymmetrical structures should not derogate from the basic purpose of the regime and should maintain certain fundamental rules and principles that apply equally to all parties.⁹⁰

Asymmetrical treatment in global environmental treaties is predicated by the essential need for universal participation in the regime. It is true that differential treatment brings with it certain disadvantages, such as increasing administrative costs, distorting international trade balances, and creating possible disincentives to the LDCs to make efforts to develop their own financing and technologies.⁹¹ However, absent differential provisions that provide selective incentives, environmental agreements may only be reached at the "lowest common denominator" in order to solicit ratification from important parties.⁹²

In the case of ozone protection, early at the Vienna Conference the negotiators called for special considerations for developing countries.⁹³ The distinguishing parameters of asymmetrical treatment under the Montreal Protocol are two-fold: a state eligible for favorable treatment must be both a

global monetary organizations (the IMF, World Bank, IDA and IFC) adopt a system of weighted voting whereby a member's voting power is determined by its amount of actual subscription. The International Civil Aviation Organization (ICAO) and Intergovernmental Maritime Consultative Organization (IMCO) both, in their constitutions, specifically reserve for certain categories of states (aviation and maritime powers) seats in their limited-membership organs ("the Councils"). For a detailed survey on this matter see D.W. BOWETT, *THE LAW OF INTERNATIONAL INSTITUTIONS* 121-40 (4th ed., 1982).

88. See Magraw, *supra* note 66, at 73-74.

89. See PETER SAND, *LESSONS LEARNED IN GLOBAL ENVIRONMENTAL GOVERNANCE* 8 (1990).

90. See Handl, *supra* note 80, at 8-10; see also Magraw, *supra* note 66, at 73-76, which classifies environmental treaty rules into differential, contextual and absolute norms.

91. Handl, *supra* note 80, at 8-10.

92. SAND, *supra* note 89, at 6. The recent negotiation of the Climate Change Convention, which, due to the U.S. opposition to specific timetables for reduction of greenhouse gases emissions, was watered down into a "toothless" compromise, is a good example. See Terry Atlas, *Worldwide Pact on Warming Reached*, CHI. TRIB., May 10, 1992, at 1, 13.

93. Final Act of the Conference of Plenipotentiaries on the Protection of the Ozone Layer: Resolution on the Protocol Concerning Chlorofluorocarbons, Mar. 22, 1985, 26 I.L.M. 1516, 1523 (1987) [hereinafter Final Act].

developing country and a country "whose annual calculated level of consumption of the controlled substances is less than 0.3 kilograms per capita."⁹⁴ The first element points to the socio-economic inability of these states to bear the same obligations as developed countries,⁹⁵ the underlying rationale of which is nothing eccentric in modern international treaty law.⁹⁶ The second element reflects the marginal contribution of the LCDs to the ozone depletion problem. Based on equitable considerations,⁹⁷ the burden under the Protocol should lie primarily with the culprit states, and, while developing countries are compelled to join the regime because of the trade restriction clause,⁹⁸ they should not be penalized for doing so.⁹⁹

The differential treatment for the so-called "Parties operating under Article 5" within the ozone regime can be summarized as follows: (1) the provision of financial and technical assistance (discussed in Section IV of this article); (2) in order to meet its "basic domestic needs" an Article 5 country has a ten-year grace period to delay its compliance with the control measures;¹⁰⁰ (3) upon application of the control measures, the base year level (1986 level in case of other states) will be either 0.3 kilograms per capita or the average of annual consumption for the 1995-97 period;¹⁰¹ and (4) with regard to control measures over production (as opposed to "consumption"), the limits may be exceeded by 10 or 15% in order to meet "the basic domestic needs" of Article 5 countries.¹⁰²

While the validity of establishing differential treatments to encourage LDCs' accession to the Montreal Protocol is rarely questioned, these provisions have been subject to continuing

94. Montreal Protocol, *supra* note 22, art. 5, para. 1.

95. See *supra* text accompanying notes 44-54.

96. See Vienna Convention on the Law of Treaties, May 23, 1969, art. 61, *reprinted in* 8 I.L.M. 679, 702 (1969) (impossibility of performing a treaty may be invoked as a ground for terminating or suspending the treaty).

97. See *supra* text accompanying notes 70-81.

98. Montreal Protocol, *supra* note 22, art. 4.

99. See Wolfrum, *supra* note 85, at 329.

100. During the grace period, a country may increase its annual consumption of CFCs up to 0.3 kilograms per capita (0.2 kilograms for halons). Montreal Protocol *supra* note 22, art. 5, para. 1; London Amendments, *supra* note 38, annex II, art. 1, § P, paras. 1, 2.

101. Montreal Protocol, *supra* note 22, at art. 5, para. 1; *London Amendments, supra* note 38, at annex II, art. 1, sec. P, para. 3 (with minor difference between CFCs and halons).

102. Montreal Protocol, *supra* note 22, art. 2, paras. 1-4; *London Amendments, supra* note 38, annex I, sec. A, paras. 3-5, sec. B, paras. 1-3, annex II, art. 1, secs. K-M.

debate. Some writers criticize the ten-year grace period with the consumption cap of 0.3 kilograms per capita as too great of a concession to developing countries,¹⁰³ arguing that if developing countries should all reach the ceiling figure within ten years, the world's CFC use in total would increase rather than decrease, clearly undermining the essential purpose of the Protocol.¹⁰⁴ The lack of definition of the key term "basic domestic needs" in the Protocol is also seen as problematic.¹⁰⁵ However, during the Protocol negotiations, it was generally believed that the LDCs would be unlikely to expand their CFC use to the ceiling level since investment in any industry that is both environmentally harmful and will soon become obsolete would be quite unattractive.¹⁰⁶ In addition, the exceptional allowance for even non-Article 5 countries to exceed production limits by 10-15% in order to meet the "basic domestic needs" of the LDCs was designed to preserve exports of CFCs from the developed countries to the LDCs and will also serve to discourage to some extent Article 5 countries from developing their own CFC industries.¹⁰⁷ Surely the strongest disincentive for LDCs to expand CFC industries is providing them with cost-effective alternative products and technologies so that the developing countries will no longer regard CFC use as indispensable to industrial development.¹⁰⁸ The Helsinki Meeting in 1989 addressed the definition of "basic domestic

103. During the negotiations, an early proposal for a five-year grace period and an annual consumption cap of 0.1 kilograms per capita was rejected by developing countries. BENEDICK, *supra* note 1, at 93.

104. See Ved P. Nanda, *Trends in International Environmental Law*, 20 CAL. W. INT'L L.J. 187, 194 (1990); Christian B. Davidson Note, *The Montreal Protocol: The First Step toward Protecting the Global Ozone Layer*, 20 N.Y.U. J. INT'L L. & POL. 793, 815-18 (1988); Paul R. Tourangeau, *The Montreal Protocol on Substances that Deplete the Ozone Layer: Can It Keep Us All from Needing Hats, Sunglasses, and Suntan Lotion?*, 11 HASTINGS INT'L & COMP. L. REV. 509, 524-25 (1988); see also Jill Granat & John Weig, *Present Efforts Will Not Make the Holes Disappear: International Efforts to Protect the Ozone Layer*, 5 FLA. J. INT'L L. 135, 141 (1989) (developed countries may skirt the control by investing in CFC industries in the LDCs). Daniel Barstow Magraw, however, suggested that the Montreal Protocol was unfair to the LDCs since CFC consumption in developed countries, even after the required 50% cut, would still be well above 0.3 kilograms per capita. Magraw, *supra* note 66, at 96-97.

105. See Tourangeau, *supra* note 104, at 525-26.

106. BENEDICK, *supra* note 1, at 93-94.

107. See Barratt-Brown, *supra* note 45, at 533-34; Douglas Hunter Ogden, Comment, *The Montreal Protocol Confronting the Threat to Earth's Ozone Layer*, 63 WASH. L. REV. 997, 1008 (1988); Annette M. Capretta, Note, *The Future's So Bright I Gotta Wear Shades: Future Impacts of the Montreal Protocol on Substances that Deplete the Ozone Layer*, 29 VA. J. INT'L L. 211, 234 (1988).

108. See Ogden, *supra* note 107, at 1006-07.

needs," and determined that the expanded manufacture of products containing CFCs solely for the purposes of supplying other nations, and not to satisfy domestic demands, was inconsistent with the intent of the Protocol to limit global use of CFCs.¹⁰⁹ Hence, any LDC expansion of its CFC-producing industries even within the ten-year grace period, would probably not be considered a bona fide fulfillment of its treaty obligations.

IV. FINANCIAL AND TECHNICAL ASSISTANCE

Asymmetrical treatment without concrete assurance of financial and technical assistance from developed countries is insufficient to induce the LDCs aboard environmental protection regimes. The economic and technological disadvantages suffered by the developing countries in their implementation of environmental standards and transformation of related industries must be fully recognized and compensated. This has emerged as one of the overriding issues in international environmental negotiations. The question now under debate seems less one of "whether aid should be given," than it is a question of in "what amount and what manner it will be given." It is estimated that developing countries need a total of 125 billion dollars per year in foreign aid to carry out fully Agenda 21, the grand UN blueprint for environmental protection into the next century. This amounts to about seventy billion dollars in excess of the existing assistance.¹¹⁰ The LDCs, fearing that environmental aid might dilute ongoing development assistance, insisted that environmental aid should be "additional to other financial transfers" to developing countries¹¹¹ and preferred new institutions to administer environmental aid. The developed countries, many of whom are still mired in economic recession, believed that that demand is unrealistically high.¹¹² They oppose a sepa-

109. BENEDICK, *supra* note 1, at 126.

110. Lewis, *supra* note 54, at 1. According to UNCED proposals, an annual amount of 650 billion dollars is demanded in the LDCs, of which 500 billion dollars will be paid by the LDCs (through redirecting resources), 55 billion dollars will be covered by existing aid and the remaining 70 billion dollars will be required from new sources. *Earth Summit Head Urges Rich to Pay for Clean-Up*, REUTERS, May 19, 1992, available in LEXIS, Nexis Library, LBYRPT File. It should be noted, however, that the increased debt burden has caused the LDCs to pay about 50 billion dollars more per year to donor countries than they receive in aid and loans. Bowser, *supra* note 28.

111. London Amendments, *supra* note 38, annex II, art. 1, sec. T, para. 1. See also G.A. Res. 2849 *supra* note 56, at 424.

112. Lewis, *supra* note 54; see also Handl, *supra* note 78, at 253-54. The current UN target for developed countries to donate 0.7% of their gross national product (GNP) for

rate, new "green fund"¹¹³ and support the existing mechanisms, particularly the World Bank (which many LDCs and environmentalists see as offering little autonomy to developing countries and lacking genuine interest in environmental affairs)¹¹⁴ and the Global Environmental Facility (GEF) established under the Bank.¹¹⁵ The United States is also concerned about the precedent-setting effect of aid arrangements in one particular regime, and afraid that much more U.S. funding would be requested in some other regime with greater money-absorbing potentials.¹¹⁶

The financial mechanism created under the London Amendments was a remarkable achievement in international efforts to protect the atmosphere. The developing countries were unsatisfied with the ambiguous aid provisions in the Montreal Protocol and did not intend to ratify the Protocol unless additional financing arrangements were allowed.¹¹⁷ During the negotiations, developed countries generally accepted their responsibility for causing the ozone crisis and recognized their duty to help developing countries comply with the protocol.¹¹⁸ The London Amendments established a mechanism to provide

environmental aid was not accepted by the U.S., and those who did accept it are not prepared to agree to specific dates to implement it. Michael Stott, *Earth Summit Starts to Clinch Agreements*, REUTERS, June 8, 1992, available in LEXIS, Nexis Library, LBYRPT File.

113. The U.S. feels a new international bureaucracy may steadily increase demand for U.S. money and the fund can be casually used for questionable projects. See Rudy Abramson, *Environmental Aid Negotiations Show Progress*, L.A. TIMES, June 8, 1992, at A1, A11; Petit, *supra* note 50.

114. Abramson, *supra* note 113; see also Lai Kwok Kin, *Rich May Arm-Twist Poor at Earth Summit—Malaysia*, REUTERS, May 25, 1992, available in LEXIS, Nexis Library, LBYRPT File (statement by Ahmed Jaffar, the Malaysian Foreign Minister).

115. The GEF was initiated by French and German proposals in the 1989 annual meeting of the World Bank. Under the agreement of Nov. 29, 1990, the 25 largest donors of the Bank pledged 1.5 billion dollars operating on a three year pilot program to help the LDCs implement environmental protection programs for the purposes of slowing down global warming, preserving bio-diversity, protecting international waters and arresting ozone depletion. See Bowser, *supra* note 28; Philip Shabecoff, *U.S. Backs World Bank Environmental Unit*, N.Y. TIMES, Nov. 30, 1990, at D2. Due to the U.S. opposition, the donors of GEF are now divided over a World Bank proposal to triple its amount for the 1994-95 period. *Donors Split on Earth Summit Aid—Bonn Official*, REUTERS, May 19, 1992, available in LEXIS, Nexis Library, LBYRPT File.

116. For example, the U.S. delegation to the ozone negotiations withheld its commitment to the financial mechanism, fearing it could become a precedent for another greenhouse fund. It was only due to the strong pressures from both the Congress and other industrialized nations that the Administration conditionally accepted the mechanism, just two weeks before the London Meeting began. See Bowser, *supra* note 28.

117. See *supra* text accompanying notes 34-35.

118. London Report, *supra* note 37, at 2, 8 (statement by Prime Minister Margaret Thatcher).

financial and technical cooperation to Article 5 countries and to meet all their agreed incremental costs in order to enable compliance with the control measures set out in the Amendments.¹¹⁹ The costs that a developing country may incur in the implementation of the Amendments normally result from (1) price hikes of CFCs and CFC-related products (due to decreased manufacture in developed countries from whom many LDCs import CFCs); (2) the relatively high price of substitute chemicals and products;¹²⁰ (3) the cost of using substitute technology (for licensing and royalty payment); (4) the cost of converting existing CFC-related facilities; (5) the rise in operational costs (for new raw materials, retraining workers, etc.); and (6) losses related to trade restrictions with nonparties.¹²¹ An "Indicative List of Categories of Incremental Costs," explaining the principles and methods of determining incremental costs, is appended to the London Amendments.¹²²

The innovative part of the financial mechanism is the creation of a Multilateral Fund to perform the principal financing functions.¹²³ As a result of the compromise between developed and developing countries,¹²⁴ the administration of the Fund follows a complex tripartite pattern. According to the London Amendments, an Executive Committee is established to develop and monitor the implementation of specific operational policies,

119. London Amendments, *supra* note 38, annex II, art. 1, sec. T, para. 1. Query: Are Article 5 countries still entitled to the ten-year period when they have received sufficient financial and technical aid?

120. European and American businesses are stepping up efforts to find alternatives to controlled substances. John Holusha, *Ozone Laws Worry Appliance Trade*, N.Y. TIMES, Feb. 10, 1992, at D2; Marlise Simons, *Europeans Worry about Ozone-Eating Chemicals*, N.Y. TIMES, Mar. 3, 1992, at A1. But according to one report, "no miracle cure" has been found. *As Evidence of Ozone Depletion Increases, Industry Scrambles for Chemical Substitutes*, 14 Int'l Env'tl. Rep. (BNA) 648 (1991). Some NGOs, however, accused the chemical industry of using expensive and hazardous substitutes to CFCs (HCFCs) in order to keep profits. They suggested that costs for use of substitutes other than HCFCs could be much lower. Bryk, *supra* note 7, at 293-94.

121. BENEDICK, *supra* note 1, at 149-50. According to an estimate by UNEP consultants, the total costs for developing countries will be 1.8 to 5 billion dollars with 1.5 to 2 billion dollars for China and India alone. See Jason M. Patlis, *The Multilateral Fund for the Montreal Protocol: A Prototype for Financial Mechanism in Protecting the Global Environment*, 25 CORNELL INT'L L.J. 181, 207 (1992).

122. London Report, *supra* note 37, annex IV, app. I, at 41.

123. For detailed provisions, see London Amendments, *supra* note 38, annex II, art. 1, sec. T, para. 3.

124. See London Report, *supra* note 37, at 8-9; see also *supra* text accompanying notes 111-115.

guidelines and administrative arrangements of the Fund.¹²⁵ The Executive Committee discharges its functions, however, with the cooperation and assistance of the World Bank, UNEP, United Nations Development Program (UNDP) and other appropriate agencies.¹²⁶ The World Bank will perform the key function of administering and managing the program to finance the agreed incremental costs.¹²⁷ UNEP will undertake political promotion of the objectives of the Protocol as well as research, data gathering and the clearing-house functions.¹²⁸ UNDP will be engaged in feasibility and pre-investment studies and other technical assistance measures.¹²⁹ For the three year period from 1991 to 1993, an interim Multilateral Fund of 160 million dollars (which may be increased by up to 80 million dollars upon accession to the Protocol by China and India)¹³⁰ was established.¹³¹

Contributions to the Fund are assessed to non-Article 5 countries on the basis of the United Nations scale of assessments,¹³² thereby the three largest contributors will be the EEC (34.67%), the U.S. (25%), and Japan (13.39%).¹³³ Bilateral and regional aid programs, under certain conditions, may be considered as a contribution to the Multilateral Fund for up to twenty percent of the total assessed contribution.¹³⁴

With all of the remarkable progress which the ozone fund signifies, it presents some problems to be solved in the future. Despite some guiding principles already laid down,¹³⁵ the identification of incremental costs for individual projects remains diffi-

125. London Amendments, *supra* note 38, annex II, art. 1, sec. T, para. 5. The Executive Committee consists of seven parties from Article 5 countries and seven parties from non-Article 5 countries. Decisions by the Committee are taken by a two-thirds majority representing a majority for both groups of countries, unless consensus can be reached. See London Report, *supra* note 37, annex IV, app. II, at 45 ("Terms of Reference of the Executive Committee").

126. London Amendments, *supra* note 38, annex II, art. 1, sec. T, para. 5.

127. London Report, *supra* note 37, annex IV, app. IV, sec. 3, 50.

128. *Id.*

129. *Id.*

130. John Hunt, *India and China Recommended to Join Ban on CFCs*, FIN. TIMES, June 30, 1990, § 1, at 1.

131. London Report, *supra* note 37, annex IV, app. IV, sec. 1, at 50.

132. London Amendments, *supra* note 38, annex II, art. 1, sec. T, para. 6. During the negotiations some delegations suggested using a scale based on 1986 consumption of controlled substances which, though more consistent with the Polluter-Pays Principle, was less plain and ready-for-use than the UN scale. See London Report, *supra* note 37, at 8.

133. London Report, *supra* note 37, annex IV, app. III, at 42-49.

134. London Amendments, *supra* note 38, at annex II, art. 1, sec. T, para. 6; London Report, *supra* note 37, annex IV, app. III, at 42-49.

135. See *supra* text accompanying note 115.

cult.¹³⁶ To some extent, an equitable determination of criteria for aid eligibility of particular projects will be a key factor for the success of the Fund. The administrative structure of the Fund is complicated, and how it will function efficiently in practice remains to be seen. An interesting legal question arises here as to whether failure by a developed country to pay its assessed sum of contribution constitutes a breach of its obligations under the London Amendments. The significance of the question may be seen in the fact that, by the time of the Third Meeting of Parties to the Montreal Protocol, only 12.7 million dollars out of 80 million dollars committed for the year had been received.¹³⁷ The U.S. delegation has expressed its idea that contribution to the Fund is not a binding obligation on developed countries.¹³⁸ However, given the fact that a developed country, upon adherence to the London Amendments and the related documents, accepted (or, at least, acquiesced in) the arrangements for the assessment to be made in accordance with the U.N. scale, the specific table of percentages to be contributed by every specific country,¹³⁹ and the budgetary authority of the Executive Committee and the regular Meeting of the Parties,¹⁴⁰ it is hard to deny the legally binding nature of the duty to contribute. The language of the Amendments also implies the existence of a legal obligation. In paragraph 6 of the amended Article 10, following the sentence that reads: "[T]he Multilateral Fund shall be financed by contributions from Parties not operating under paragraph 1 of Article 5 . . .," it is said that "[c]ontribution by other parties shall be encouraged."¹⁴¹ While this clearly suggests that contribution by "other parties" (namely parties that do operate under paragraph 1 of Article 5) is not legally obligatory, it also implies that contribution by non-Article 5 countries is, indeed, something more than to be "encouraged."

Perhaps more problematic in the London Amendments are the provisions concerning transfer of technology. Access to

136. See Patlis, *supra* note 121, at 203; Bowser, *supra* note 28. Some African countries even lack the technical and administrative expertise to set up projects and apply for funds. *Developing Countries Said to Face Serious Problems in Applying for Protocol Money*, 15 Int'l Env'tl. Rep. (BNA) 127 (1992).

137. Winfried Lang, 1991, *The Year in Review*, 2 Y.B. INT'L ENVTL. L. (forthcoming 1992).

138. *Id.*

139. London report, *supra* note 37, annex IV, app. III, at 42-49.

140. *Id.* annex IV, app. IV, secs. 12 & 13, 51.

141. London Amendments, *supra* note 38, annex II, art. 1, sec. T, para. 6.

environmentally-safe technology is the best assurance of a self-reliant sustainable development in developing countries.¹⁴² In the field of ozone layer protection, the Helsinki Declaration of 1989 recognized "the urgent need to facilitate the transfer of technologies" of CFC substitutes to developing countries.¹⁴³ The developing countries vehemently demanded that transfer of technology be conducted on a free or noncommercial basis, arguing that those who are responsible for causing the environmental degradation should not profit from their wrongdoing.¹⁴⁴ For those developing countries who already commanded CFC technologies and can independently manufacture CFCs and related products, it would not be acceptable to provide them only with imported substitute products rather than new technologies that would enable them to produce their own substitute products.¹⁴⁵ The London Amendments do include technology transfers as one of the main objects of the financial mechanism.¹⁴⁶ The new Article 10A provides that

[e]ach Party shall take every practicable step to assure: (a) That the best available environmentally safe substitutes and related technologies are expeditiously transferred to Parties operating under paragraph 1 of Article 5; and (b) That the transfers referred to in subparagraph (a) occur under fair and most favorable conditions.¹⁴⁷

However, the reference to the clichéd phrase "every practicable step," in effect, nullifies the legally obligatory nature of the prescription. The developed countries were puzzled with the idea that governments may enforce transfer of technologies (on a concessionary basis) that are owned by private enterprises. They were concerned that transfer of technologies as required by the developing countries would result in poor protection of intellectual property rights and, thus, undermine the incentives for

142. See Margaret E. Somerset, *An Attempt to Stop the Sky from Falling: The Montreal Protocol to Protect Against Atmospheric Ozone Reduction*, 15 SYRACUSE J. INT'L L. & COM. 391, 420 (1989).

143. Helsinki Declaration on the Protection of the Ozone Layer, May 2, 1989, reprinted in 28 I.L.M. 1335, 1335-36 (1989).

144. See Declaration of Brasilia, *supra* note 61, para. 10, at 1313; Amazon Declaration, *supra* note 68, para. 8, at 1304-05; see also London Report, *supra* note 37, at 9; Stockholm Declaration, *supra* note 60, princ. 20, 1420 ("[E]nvironmental technologies should be made available to developing countries on terms which would encourage their wide dissemination without constituting an economic burden on developing countries.").

145. BENEDICK, *supra* note 1, at 157-58.

146. London Amendments, *supra* note 38, annex II, art. 1, sec. T, para. 1.

147. *Id.* sec. U.

research and development in environmental technologies.¹⁴⁸ This problem is, unfortunately, deadlocked for the time being. While the developing countries are fully justified both for practical and equitable reasons to request transfer of technologies on a preferential basis, adequate protection of private patent rights must be addressed in any feasible arrangements. This, however, may succeed only if adequate funding under the financial mechanism is assured to the developing countries. It may be expected that a substantial amount of the Multilateral Fund will be devoted to financing technical cooperation for the developing countries.

V. NONCOMPLIANCE AND IMPLEMENTATION

Implementation of international conventions on the environment against noncompliance by a contracting state (or, under another title, peaceful settlement of international environmental disputes) is now becoming a challenging question that calls for innovative visions in international law. While the existing voluminous literature on state liability for internationally wrongful acts and on judicial settlement of international disputes does provide invaluable insight for a thorough understanding of environmental problems, the peculiar nature of international environmental disputes necessitate some rethinking about the bases and means of dispute settlement in the environmental field.

Environmental disputes are distinguished from other social conflicts in that their continuing existence may lead to irreversible catastrophes, their scientific and socioeconomic dimensions tend to be indeterminate, and intricate community interests and sovereign rights of parties are often at stake.¹⁴⁹ Accordingly, a sensible means of dispute settlement must be: (1) effective (all parties involved *do believe* the dispute has been settled and their future behavior is prevented from causing the same kind of dispute again); (2) fair (the procedure and outcome are acceptable to all parties); (3) efficient (not too time-consuming or expensive); and (4) good for the community (community interests are preserved and a commendable pattern is set for the behavior of

148. See BENEDICK, *supra* note 1, at 157; Bryk, *supra* note 7, at 295-96; see also Keith Schneider, *U.S. to Reject Pact on Protection Wildlife and Global Resources*, N.Y. TIMES, May 30, 1992, at A1; Perlez, *supra* note 57, for the U.S. arguments against the Biological Diversity Convention.

149. See Lawrence Susskind & Alan Weinstein, *Towards a Theory of Environmental Dispute Resolution*, 9 B.C. ENVTL. AFF. L. REV. 303, 303-37 (1980).

other actors).¹⁵⁰ In light of these criteria, a liability-based court approach to solving environmental dispute would be inappropriate.

Most international conventions on environmental protection contain no specific provisions on state responsibility and liability. First of all, to what extent the technical rules, standards and regulations laid down in many environmental conventions impose positive, enforceable legal obligations on contracting states is uncertain, and the international wrongfulness of an act not in compliance with these rules is difficult to determine.¹⁵¹ Long-range and long-term environmental harms from multiple sources also make it unlikely to attribute liability to a particular state.¹⁵² The standard of due diligence may often be invoked to mitigate claims of liability, as many instances of noncompliance will conceivably result from the financial and technical inability of a state to implement the environmental conventions.¹⁵³ Resort to international courts and tribunals to solve environmental disputes has been uncommon, and environmental conventions scarcely provide for compulsory dispute settlement mechanisms. The criticisms by environmentalists of the judicial approach include:¹⁵⁴ (1) international tribunals conventionally deny *locus standi* to nonstate actors such as NGOs and transnational corporations (TNCs), who play important roles in international environmental affairs today; (2) the applicable law to the disputes, mostly relevant rules in environmental conventions, treaties and protocols, is often too vague and rudimental for adjudication of a specific case; (3) judicial process tends to be complex, expensive and time-consuming,¹⁵⁵ and (4) judges are generally thought to be unqualified in technical matters and too conservative to produce a "green" solution.¹⁵⁶

However, a more fundamental reason for upholding a new noncompulsory mechanism, instead of the old judicial process, lies in the special regime-building process in the field of interna-

150. See Richard B. Bilder, *The Settlement of Disputes in the Field of the International Law of the Environment*, 114 R.C.A.D.I. 119, 162-63 (1975-I).

151. Koskenniemi, *supra* note 70, at 79-80.

152. SAND, *supra* note 89, at 30.

153. Koskenniemi, *supra* note 70, at 80.

154. See Bilder, *supra* note 150, at 224-26; ALLEN L. SPRINGER, *THE INTERNATIONAL LAW OF POLLUTION*, 158-61 (1983).

155. It took 15 years to solve the famous Trail Smelter dispute. See SAND, *supra* note 89, at 30.

156. See Koskenniemi, *supra* note 70, at 82.

tional environmental protection. Environmental conventions and protocols drawn up in the past two decades are characterized by the phenomenon called "proceduralization."¹⁵⁷ The agreements often contain a few general substantive principles coupled with more specific and detailed procedural provisions (on monitoring, notification, periodical review, institutionalized consultation, adoption of amendments and protocols, etc.).¹⁵⁸ They are short of setting forth specific substantive rules for two reasons. First, the normative prescriptions under the regime need to be substantiated or subsequently amended to adapt themselves to the frequent change in the cognitive expectation (namely, relevant scientific knowledge over the particular subject matter).¹⁵⁹ Second, the framework convention needs to bypass what is conceived to be the present difficulty in compromising the conflicting political and socioeconomic policies of various states and defer it to further processes.¹⁶⁰ Having laid down the general commitments of the parties in the target field ("the constructive ambiguities"),¹⁶¹ the implementing norms and standards will be materialized in the further cooperation among states (in some cases coupled with unilateral action by some advanced states),¹⁶² taking into account every relevant factor in

157. *Id.* at 74.

158. *Id.* In the case of the ozone regime, see Vienna Convention, *supra* note 17, arts. 5 (transmission of information), 6 (conference of the Parties), 7 (secretariat), 8 (adoption of protocols), 9 (amendment of the Convention or protocols), 10 (adoption of amendment of annexes); Montreal Protocol, *supra* note 23, art. 2, paras. 9 (adjustments to the Protocol) 10 (amendment of annexes), art. 4, paras. 3, 4 (adoption of an annex listing products containing or produced with controlled substances), arts. 6 (assessment and review of control measures), 7 (reporting of data), 11 (meeting of the Parties), 12 (secretariat); London Amendments, *supra* note 38, annex I, sec. A, para. 6 (review of the reduction schedule), sec. B, para. 4 (decision to identify essential uses of halons), annex II, art. 1, sec. M, para. 5 (review of the reduction schedule), sec. O, para. 1 (adoption of an annex listing products containing or produced with controlled substances), sec. P, para. 8 (review of situation of Article 5 countries), sec. R (reporting of data).

The Climate Change Convention and the Biological Diversity Convention, which are the same kind of "framework convention" as the Vienna Convention, bear similar characteristics. See *supra* notes 1, 17, 84, and *infra* text accompanying notes 193-203.

159. See Thomas Gehring, *International Environmental Regime: Dynamic Sectoral Legal Systems*, 1 Y.B. INT'L ENVTL. L. 35, 38-50 (1990).

160. See Koskenniemi, *supra* note 70, at 74.

161. *Agreement Reached on Climate Changes; Accord Seen as First Step Only to Curb Gases*, 15 Int'l Env'tl. Rep. (BNA) 284 (1992).

162. See Koskenniemi, *supra* note 70, at 78. For the significance of the process to the global warming problem, see Atlas, *supra* note 92; Petit, *supra* note 50; Rudy Abramson, *U.S. Flexes Its Muscle Before Earth Summit*, L.A. TIMES, May 30, 1992, at A19. However, the ultimate solution to the environmental crises still requires diplomatic maneuvers and struggles in the future, with inevitable sacrifice of some parties' positions.

the particular circumstances to forge an equitable balancing of interests among state parties.¹⁶³ As a result, the operative rules in the regime tend to go beyond the formal treaty provisions as originally set forth in the conventions and protocols. A court, in applying formal treaty rules to resolve a dispute will be likely to deviate from the genuine normative expectation prevailing in the regime.¹⁶⁴ The parties in the regime will prefer *internalizing* the dispute settlement, for to confer upon a court such discretionary power as to dispose of the dispute equitably out of the contextual considerations might prove treacherous.¹⁶⁵ When an incident of noncompliance is alleged to have happened, it will be in the best interests of the regime as a group to preserve the inherent fabric of basic normative expectation against both the incidental non-compliance and the intrusion by an outside third party.¹⁶⁶ The internalized dispute settlement procedure will accordingly make every effort to achieve an amicable solution through a consensus-shaping process involving consultation, investigation, mediation and conciliation.¹⁶⁷ In this process, the essential values, which the regime is designed to cherish and which become threatened upon noncompliance, will best be preserved if the disputed behavior, as well as the normative expectation surrounding it, can be adjusted in accordance with the same logic and dynamic by which the regime has developed. Thus, periodic peer review and monitoring based on a common conviction of accountability to the regime will serve as the principal means of ensuring compliance.¹⁶⁸ Some instances of noncompliance may be tolerated if they truly arise out of the economic and technical inability of the state to implement the control measures, and the state concerned has made maximum efforts to fulfill its commitments. In such a case, after credible investigation, assistance

See Koskeniemi, *supra* note 70, at 84-86; cf. Stanley Meisler, *A Day in the Life of Mother Earth: Environmental Warrior Urges a Battle Plan*, L.A. TIMES, May 26, 1992, at A12 (statement by Mostafa Tolba).

163. See Koskeniemi, *supra* note 70, at 81.

164. Gehring, *supra* note 159, at 51, 55.

165. See Koskeniemi, *supra* note 70, at 81-82.

166. See Gehring, *supra* note 159, at 51-52.

167. See, e.g., Bilder, *supra* note 150, at 227 (favoring joint commissions as a means of dispute settlement); Bruce E. Barnes, *Environmental Mediation: A Tool for Resolving International Environmental Disputes in the 'Pacific' Way*, in WORKSHOP: THE FUTURE OF THE INTERNATIONAL LAW OF THE ENVIRONMENT 167 (Hague Academy of International Law, 1985) (favoring mediation); Susskind & Weinstein, *supra* note 149 (favoring a consensual bargaining process).

168. See SAND, *supra* note 89, at 32-34.

may be provided to enable the state to comply with the relevant norms, or consensus among the parties may be reached on reinterpretation of certain normative expectations.¹⁶⁹ While resort to sanctions is not precluded on extreme occasions, it plays such a minor role in this procedure that no reference to it is made in most environmental conventions. Emphasizing the role of sanctions, as some writers proposed for the ozone regime,¹⁷⁰ will, in most cases, fail to address the real problem underlying the non-compliance and will not best remedy the endangered environment which the regime is committed to protect. In essence, unlike a liability-based court or sanction-oriented approach which treats the problem *post facto*, internalization of dispute settlement follows a forward-looking, preventive approach which emphasizes avoiding the problem before it ever occurs.¹⁷¹

The still evolving noncompliance procedure in the ozone regime exemplifies the internalized pattern. The Montreal Protocol provides for peer review by requiring the parties to provide annually to the Secretariat the statistical data on its annual production, imports and exports to parties and nonparties, respectively, of controlled substances. The regular meeting of the parties is empowered to review the implementation of the Protocol.¹⁷² The London Meeting of 1990 adopted a noncompliance procedure on an interim basis.¹⁷³ The procedure created a ten-member (originally five member) Implementation Committee whose function is to review and report on any submissions made by one or more parties against another party regarding the latter's implementation of its obligation under the Protocol.¹⁷⁴ It

169. See Koskenniemi, *supra* note 70, at 80; Gehring, *supra* note 159, at 52-54.

170. See Joel A. Mintz, *Keeping Pandora's Box Shut: A Critical Assessment of the Montreal Protocol on Substances that Deplete the Ozone Layer*, 20 U. MIAMI INTER-AM. L. REV. 565, 576-77 (1989); Ved P. Nanda, *Stratospheric Ozone Depletion: A Challenge for International Environmental Law and Policy*, 10 MICH. J. INT'L L. 482, 492 (1989); Mintz, *supra* note 10, at 582; Alice M. Noble-Allgire, *The Ozone Agreements: A Modern Approach to Building Cooperation and Resolving International Environmental Issues*, 14 S. ILL. U.L.J. 265, 291-93 (1990); Faries, *supra* note 7, at 842; H. Christian Sorensen, *Recent Developments, International Agreements*, 29 HARV. INT'L L.J. 185, 190-91 (1988).

171. See SAND, *supra* note 89, at 33-34; Lawrence, *supra* note 8, at 50.

172. Montreal Protocol, *supra* note 22, art. 7, art. 11, para. 4(a); see also Vienna Convention, *supra* note 17, art. 5, art. 6, para. 4; London Amendments, *supra* note 38, annex II, art. 1, sec. R.

173. London Report, *supra* note 37, annex III, at 40. The interim procedure was supported by the EC and many developing countries. The U.S. and Nordic countries, however, favored a stronger approach that would provide for trade restrictions against noncomplying nations in order to deter free riders. See BENEDICK, *supra* note 1, at 183.

174. London Report, *supra* note 37, annex III, sec. 5(a), 40.

may also review and report on any information or observation forwarded by the Secretariat in connection with its preparation of the report.¹⁷⁵ Thus, even if no submission is brought by other states against a state whose implementation is questionable, the Committee may still review the matter upon the initiative of the Secretariat. In both cases, it is provided that "[t]he Committee shall consider the submission, information and observations . . . with a view to securing an amicable resolution of the matter on the basis of respect for the provisions of the Protocol."¹⁷⁶ This clearly indicates the nonjudicial character of the Committee,¹⁷⁷ as it is permitted to deviate somehow from the formal treaty provisions (so long as some degree of "respect" is indicated) in its effort to bring about an amicable solution of the matter. After the Committee reports to the Meeting of the Parties, the Parties "may, take into consideration the circumstances of the case, decide upon and call for steps to bring about full compliance with the Protocol, including measures to assist the Party's compliance with the Protocol, and to further the Protocol's objective."¹⁷⁸ The Meeting of the Parties does not perform a law-enforcement function, but rather engages in a consensus-shaping process aimed at achieving an equitable and practicable internalized solution to the problem under consideration. Special considerations are given to the developing countries in the revised Article 5 of the London Amendments. It is recognized that developing the capacity to implement and comply with the control measures is dependant on the effective implementation of financial cooperation and the transfer of technology.¹⁷⁹ As a general policy, therefore, developing countries may be exempt from compliance with the control measures if financial and technical aid is unavailable or inadequate. It is further provided that an Article 5 country may at any time notify the Secretariat that, having taken all practicable steps, it is unable to implement the control measures due to inadequate financial and technical assistance, which shall be considered at the next Meeting of Par-

175. *Id.* sec. 5(b), at 40.

176. *Id.* sec. 6, at 40 (emphasis added).

177. The Ad Hoc Working Group of Legal Experts on Non-Compliance, which was mandated to elaborate upon further procedures on noncompliance and terms of reference of the Implementation Committee, reached a unanimous view that the Committee would have no judicial or executive power and its procedures would be of a nonadversarial nature. Lang, *supra* note 137.

178. London Report, *supra* note 37, annex III, sec. 7, at 40 (emphasis added).

179. London Amendments, *supra* note 38, annex II, art. 1, sec. P, para. 5.

ties.¹⁸⁰ During the period between notification and the Meeting, or for a further period if the Meeting should so decide, the normal noncompliance procedure shall not be invoked against the notifying party.¹⁸¹ While a developing country is not *ipso facto* absolved from the obligation, the principle as set down here can operate as a strongly favorable factor for a developing country in the consideration of its noncompliance by the Implementation Committee and the Meeting of Parties.

The noncompliance procedure is not without deficiencies. The effective functioning of the procedure is contingent on the availability of credible and verifiable data relevant to the implementation of the Protocol.¹⁸² As mentioned earlier, the Protocol obligates each party to report required data to the Secretariat.¹⁸³ However, some developing countries even lack the technical and economic resources necessary to fulfill their reporting duty.¹⁸⁴ The fact-finding function of the procedure needs to be strengthened to ensure the completeness and accuracy of the data reported.¹⁸⁵ NGOs, personalizing the environmental awareness of the public, should be allowed more access to the whole procedure. With their technical expertise and grassroots links with the public, the NGOs, through informal monitoring and verification, may play an important role in promoting the efficacy of the procedure. Provisions should be made to enable the NGOs to report relevant data, to initiate the noncompliance procedure against a suspect state, to sit as observers in the Meeting of the Parties,¹⁸⁶ and to perform advisory functions in the decision-making process on noncompliance.¹⁸⁷ The confidentiality of information involved in the procedure should be kept to a minimum so that the procedure is kept under public surveillance and

180. *Id.* para. 6.

181. *Id.* para. 7.

182. See Final Act, *supra* note 93, at 1549.

183. See *supra* text accompanying note 172.

184. Out of 48 countries required to submit their 1989 data, only 23 complied and only 20 reports were complete. See Lang, *supra* note 137.

185. See Barratt-Brown, *supra* note 45, at 542-43.

186. See Montreal Protocol, *supra* note 22, art. 11, para. 5. As to the Implementation Committee, it has been agreed upon in the Ad Hoc Working Group that a state who is not a member of the Committee but is a party to the matter under consideration may attend the considerations of the Committee. Nevertheless, a state who is neither a member of the Committee nor a party to the matter cannot take part in the consideration. Lang, *supra* note 137.

187. See Handl, *supra* note 80, at 18-19; Barratt-Brown, *supra* note 45, at 547-48, 564-65, 569-70.

non-compliance may be rectified quickly and effectively.¹⁸⁸ Finally, it is interesting to note that there is a dispute settlement clause in the Vienna Convention providing for conciliation of disputes (unless the Parties accept arbitration or litigation in the ICJ). The ad hoc conciliation commission, composed of members appointed by the parties, shall "render [a] final and recommendatory award, which the parties shall consider in good faith."¹⁸⁹ Non-internalized in its nature, this procedure may serve as an alternative to the interim non-compliance procedure should the parties to the dispute so choose.¹⁹⁰

VI. CONCLUSION

Global environmental regimes can hardly attain their prescribed goals if participation by developing countries is not assured. Special consideration of the needs and interests of developing countries is a common issue for nearly all the global environmental protection regimes. Notwithstanding certain special characteristics of the ozone problem,¹⁹¹ the ozone regime soundly addresses the issue and will serve as a paradigm for other environmental regimes.¹⁹² The recent developments at the Earth Summit exemplify this tendency. Both the Climate Change Convention and the Biological Diversity Convention

188. London Report, *supra* note 37, at annex III, sec. 11, at 41. Any data on consumption submitted to the secretariat under Article 7 are not confidential. *Id.* at 15.

189. Vienna Convention, *supra* note 17, art. 11.

190. The Vienna Convention procedure shall apply with respect to any protocol except as provided otherwise in the protocol. *Id.* art. 11, para. 6. The Interim Non-Compliance Procedure contains no such provisions, and the Ad Hoc Working Group tends to consider the two procedures as separate and distinct. Lang, *supra* note 137.

191. At the London Meeting of 1990, the U.S. delegation objected to using the ozone regime as a precedent for other environmental programs, asserting that the ozone regime is peculiar in that the ozone crisis is scientifically established, that the fund offering will make a real difference in encountering the problem, and that the needed amount of funding is predictable. As a compromise, the London Amendments provide that the ozone financial mechanism is "without prejudice to" any future environmental arrangements. London Amendments, *supra* note 38, annex II, art. 1, sec. T, para. 10; see BENEDICK, *supra* note 1, at 184. For the difference between the problems of ozone layer deletion and global warming, see Winfried Lang, *Is the Ozone Depletion Regime a Model for an Emerging Regime on Global Warming*, 9 UCLA J. ENVTL. L. & POL'Y 161 (1991).

192. See London Report, *supra* note 37, at 9; BENEDICK, *supra* note 1, at xiii; Richard E. Benedick, *The Montreal Ozone Treaty: Implications for Global Warming*, 5 AM. U.J. INT'L L. & POL'Y 227 (1990); PATRICK SZELL, OZONE LAYER AND CLIMATE CHANGE, in ENVIRONMENTAL PROTECTION AND INTERNATIONAL LAW 167 (Winfried Lang, et al. eds., 1991); David D. Caron, *Protection of the Stratosphere Ozone Layer and the Structure of International Environmental Law Making*, 14 HASTINGS INT'L. & COMP. L. REV. 755 (1991).

accept the special entitlement of developing countries based on practical and equitable considerations.¹⁹³

The Climate Change Convention explicitly differentiates between the obligations for developed countries (who are enumerated in an annex) and developing countries by providing separately for commitments applicable to "all Parties" and commitments applicable to "the developed country Parties" only.¹⁹⁴ The Biological Diversity Convention, in its controversial provisions on transfer of technology,¹⁹⁵ goes beyond the Montreal Protocol and takes a stronger approach to compel transfer of technologies to developing countries. The most innovative part of the provisions deserves a full quotation:

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

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

5. The Contracting Parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in

193. Climate Change Convention, *supra* note 84, pmbl., art. 3, paras. 1, 2; Biological Diversity Convention, *supra* note 1, at pmbl.

194. Climate Change Convention, *supra* note 84, art. 4, para. 1 (commitments applicable to all parties), paras. 2-5 (commitments applicable to developed countries). The Convention also contains special provisions for the "Parties undergoing the process of transition to the market economy" (namely the former Soviet Union and Eastern European countries, art. 2, para. 6) and some special categories of developing countries (art. 2, paras. 8, 9). The Biological Diversity Convention, in its provision on financial assistance, also differentiates between developed countries, developing countries and countries undergoing the process of transition to a market economy. Biological Diversity Convention, *supra* note 1, art. 20, para. 2.

195. See BENEDICK, *supra* note 1, at 148.

order to assure that such rights are supportive of and do not run counter to its objectives.¹⁹⁶

Both the Climate Change Convention and the Biological Diversity Convention define a financial mechanism to channel funds to developing countries in order to help them implement the Conventions.¹⁹⁷ Both conventions make compliance by the developing countries conditional upon the availability of financial and technical assistance.¹⁹⁸

Both Conventions require periodic reporting by the Parties on their implementation of the Conventions¹⁹⁹ and provide for peer review at the Conference of Parties.²⁰⁰ As framework conventions, both establish procedures to substantiate their provisions in the future through further interdisciplinary studies and adoption of protocols, amendments and annexes.²⁰¹ Finally, regarding implementation of the Conventions and other Earth Summit documents, the Earth Summit agreed to set up a United Nations Commission on Sustainable Development pending approval by the General Assembly.²⁰² The Commission, modelled on the UN Human Rights Commission, will use peer pressure and public opinion to compel nations to follow environmentally sound policies, but has no power to impose sanctions. It will monitor states' compliance with the two Conventions and Agenda 21 and will ensure that developed countries honor their commitments to offer financial and technical aid. Its activities will rely heavily on cooperation from NGOs.²⁰³ These achievements all clearly reflect the basic considerations and principles as embodied in the ozone regime.

Two decades have passed since the Stockholm Declaration affirmed that environmental problems "will require extensive

196. Biological Diversity Convention, *supra* note 1, arts. 16, 19.

197. Climate Change Convention, *supra* note 84, art. 11; Biological Diversity Convention, *supra* note 1, arts. 21, 39.

198. Climate Change Convention, *supra* note 84, art. 3, para. 7; Biological Diversity Convention, *supra* note 1, art. 20, para. 4.

199. Climate Change Convention, *supra* note 84, art. 12; Biological Diversity Convention, *supra* note 1, art. 26.

200. Climate Change Convention, *supra* note 84, art. 7, para. 2; Biological Diversity Convention, *supra* note 1, art. 23, para. 4(a).

201. Climate Change Convention, *supra* note 84, art. 4, para. 2(d), art. 7, para. 2, arts. 9, 15-17; Biological Diversity Convention, *supra* note 1, art. 23, para. 4, arts. 25, 28-30.

202. Paul Lewis, *Delegates at Earth Summit Plan a Watchdog Agency*, N.Y. TIMES, June 7, 1992, at A20.

203. *Id.*

cooperation among nations and actions by international organizations in the common interest."²⁰⁴ The success of the ozone layer protection regime has been both a product and a symbol of the spirit of global partnership and planetary solidarity. While it is true that environmental diplomacy behind closed doors still presents itself as old-fashioned politicized bargaining among nationalistic self-interests,²⁰⁵ never before in history have the people of the global community so deeply and unequivocally realized the precariousness of this planet and the need for cooperation among all the states and peoples. The ozone regime marks a victory in the battle against environmental calamities. A much higher level of commitment and cooperation between industrialized nations and developing countries needs to be stimulated if the security and welfare of our coming generations are to be sustained.

"Developed countries are in first class, and I'm in economy" said Emil Salim of Indonesia. "But the plane is crashing."²⁰⁶

204. Stockholm Declaration, *supra* note 60.

205. See Preston & Robinson, *supra* note 55.

206. Thatcher, *supra* note 50.