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Exclusive Sovereignty versus Sustainable Development of a Shared Resource: The Dilemma of Latin American Rainforest Management

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SUMMARY

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"People do not move into forests from choice, but from the lack of it."[1]

I. INTRODUCTION: THE NEED FOR SUSTAINABLE DEVELOPMENT

Rainforest destruction is one of the most studied but intractable global environmental problems. We no longer view tropical forests simply as commodities to be exploited to the maximum extent possible. Contrary to earlier thinking, rainforests are biologically rich but extremely fragile and complex ecosystems[2] with limited regeneration potential. Their biological wealth is in the canopy not in the soil,[3] and thus intensive development effectively converts rainforests into nonrenewable resources.[4] Thus, science counsels that these resources should be conserved and managed to sustain a variety of commodity and non-commodity uses, but the economics and culture of underdevelopment propel the host countries toward rapid exploitation.

The immediate roots of the current unsustainable levels of exploitation began in the 1960s when South and Central American countries began to use foreign loans to develop their forests for mineral extraction, cattle ranching, export crops such as cotton, sugar, fruits and flowers, as well as for ambitious population resettlement programs. Logging also increased as superior Southeast Asian and West African hardwood forests were consumed.[5] In the 1980s and early 1990s, rainforest destruction was widely publicized in both the developed and developing worlds as a major example of international environmental degradation. Some host countries became more sensitive to the problem and took steps to discourage conversion to more intensive uses[6] and to develop new management strategies to balance forest use and conservation.[7]

The paradox of rainforest destruction is that the emerging global perception of forests as increasingly valuable bioreserves is not as widely shared by the host countries as it is in

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1. THE WORLD ENVIRONMENT 1972–92, at 163 (Mostafa K. Tolba et al. eds., 1992).

2. Many important ecosystem relationships such as the removal of forest cover and downstream water flows are not fully understood. *See* D.S. Cassells et al., *The Protective Role of Tropical Forests: A State of Knowledge Review, in* AGROFORESTRY IN THE HUMID TROPICS: ITS PROTECTIVE AND AMELIORATIVE ROLES TO ENHANCE PRODUCTIVITY AND SUSTAINABILITY 31, 31 (Napoleon T. Vergara & Nicomedes D. Briones eds., 1987).

3. *See* Donald R. Perry, *Tropical Biology, in* LESSONS OF THE RAINFOREST 25, 28–29 (Suzanne Head & Robin Heinzman eds., 1990).

4. *See* CHERYL SIMON SILVER & RUTH S. DEFRIES, ONE EARTH, ONE FUTURE 120 (National Academy of Sciences 1990).

5. *See* THE LAST RAINFORESTS: A WORLD CONSERVATION ATLAS 110–24 (Mark Collins ed., 1990).

6. For example, after the election of Fernando Collor de Mello in 1990, Brazil shifted its position from the refusal to recognize any international interest in rainforest destruction to a willingness to trade protection for economic assistance. *See* Jayne E. Daly, *Toward Sustainable Development: In Our Common Interest*, 1995 PACE L. REV. 153, 178 (1995). Brazil's initial response to the international criticism of development policies that surfaced after the 1972 United Nations Stockholm environmental conference was to create an extensive system of parks and nature reserves. The sad history of this effort is briefly discussed at notes 138–40 *infra*.

7. Article 4 of the 1988 Federal Constitution of Brazil, for example, declares that Amazonia and other great forest areas of the country are part of the nation's national patrimony. CONSTITUIÇÃO FEDERAL art. 4 (Braz.). However, yet another cycle of forest clearing and burning and species destruction has begun in Brazil. *See Intentional Rainforest Burning Five Times Higher Than Same Period Last Year*, 18 Int'l Env't Rep. (BNA) No. 23, at 877 (Nov. 15, 1995); Diana Jean Schemo, *Burning of Amazon Picks Up Pace, With Vast Areas Lost*, N.Y. TIMES, Sept. 12, 1996, at A3. The measurement of the rate of destruction through the use of satellite images is an evolving science. *See* J.G. Soussan & A.C. Millington, *Forests, Woodlands and Deforestation, in* ENVIRONMENTAL ISSUES IN THE 1990S, at 79, 85 (A. M. Mannion & S. R. Bowlby eds., 1992).

At a 1995 meeting of the foreign ministers of the signatories to the Treaty for Amazon Cooperation July 3, 1978, 1202 U.N.T.S. 51, the ministers created a permanent secretariat and a financial institution to channel aid to the region. Abraham Lama, *Environment-Amazon: In Search of Sustainable Development*, Inter Press Service (Dec. 6, 1995).

the developed world.[8] This paradox is not surprising—global concern about the use of rainforests is a product of the scientific nature of environmentalism and the changes in human valuation of tropical resources produced by widely disseminated scientific information among global elites.[9] The net result is that the scientific environmentalism[10] is causing a fundamental global paradigm shift away from a focus on unrestrained, rapid economic growth toward one of environmentally sustainable development.[11] This shift is illustrated in the environmental conception of tropical rainforests.[12] In the past generation what was an inhospitable jungle or a hardwood forest inhabited by savage tribes of "Indians" is now an extremely fragile biodiversity hot spot,[13] extractive reserve, and carbon sink. The responsibility for managing rainforests should be shared between the nation-state

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8. *See* Fabio Feldmann, Address at the symposium *Sustainable Development in Latin Amercan Rainforests and the Role of Law* (Feb. 29, 1996) (notes on file with the *Texas International Law Journal*). Rainforest countries such as Brazil and Colombia have the full range of modern environmental problems and often the control of air and water pollution is a higher priority than rainforest protection.

9. Environmentalism derives its primary force from the universal warning messages of elite science because science's universal acceptance as a legitimate source of values decreases the importance of cultural, political and legal differences. As James Rosenau has written:

> Politicians cannot exercise control over environmental outcomes without recourse to scientific findings. They may claim that the findings are not clear-cut or remain subject to contradictory interpretations, but they are nonetheless dependent on what the practices of science uncover about the laws of nature.... [C]riteria of proof are at the heart of environmental politics ... the outcomes of environmental issues depend as much on the persuasiveness of evidence as on the various criteria of power—superior resources, greater mass support, skill at coalition formation—that sustain or resolve other types of issues.

James N. Rosenau, *Environmental Challenges in a Global Context*, *in* ENVIRONMENTAL POLITICS IN THE INTERNATIONAL ARENA 257, 258 (Sheldon Kamieniecki ed., 1993). *See also* Lester W. Milbrath, *The World is Relearning Its Story about How the World Works*, *in id.* at 21. This is true both internationally and domestically. As Roger Findley notes, the rainforest protection movement in Brazil is centered in its major urban and commercial center, São Paulo. Roger Findley, Address at the symposium *Sustainable Development in Latin American Rainforests and the Role of Law* (Mar. 1, 1996) (notes on file with the *Texas International Law Journal*).

There has been comparatively little systematic study of the gap between how elites and non-elites view the environment, but social scientists are now paying more attention to this problem. A recent effort to fill this gap, STEPHEN R. KELLERT, THE VALUE OF LIFE: BIOLOGICAL DIVERSITY AND HUMAN SOCIETY (1996), identifies nine basic values of nature ranging from the positive ones (the neutral utilitarian perspective) to the negative (the fear and loathing of nature). For the positive noncommodity values of rainforests, Kellert distinguishes among naturalistic, ecologistic-scientific and aesthetic values and finds that in the United States support for biodiversity is concentrated on largely vertebrate animals of special cultural interest and that "[c]oncern for biological diversity and natural process continues to be limited and superficial." *Id.* at 62.

10. I have attempted to defend the primacy of science as a source of environmental law in A. Dan Tarlock, *Environmental Law: Science or Ethics?*, 17 DUKE ENVTL. L. & POL'Y FORUM (forthcoming 1997).

11. *See generally* DEVELOPMENT AND THE ENVIRONMENT: SUSTAINING PEOPLE AND NATURE (Dharam Ghai ed., 1994); ENVIRONMENT AND THE POOR: DEVELOPMENT STRATEGIES FOR A COMMON AGENDA (H. Jeffrey Leonard et al. eds., 1989); LANDS AT RISK IN THE THIRD WORLD: LOCAL LEVEL PERSPECTIVES (Peter D. Little et al. eds., 1987).

12. Forest use is ultimately the product of diverse cultural perceptions of the forest. Forests have been perceived as sources of both awe and dread, and the conservation and exploitation policies that nations adopt oscillate between these two poles. The historical evolution of our perceptions of forests has recently received two excellent scholarly treatments which trace the historical roots of the competing ideas of forests as sacred places or as the objects of scientific management. ROBERT P. HARRISON, FORESTS: THE SHADOW OF CIVILIZATION (1992) offers a cultural-historical explanation for the widespread concern about deforestation which links the idea of the primeval forest as the repository of culture. SIMON SCHAMA, LANDSCAPE AND MEMORY (1995) traces the influence of Roman, Jewish, and Christian "dread of the somber woodland depths," *id.* at 227, and the influence that this thinking has had on the exploitation of forests.

13. EDWARD O. WILSON, THE DIVERSITY OF LIFE 259–70 (1992) defines "hot spots" as areas with many species found nowhere else facing severe extinction threats. These are generally forests and coral reefs. Wilson identifies four such forest areas in South America.

in which the forest is located, indigenous peoples living in the forest,[14] and the international community.

The historic[15] and present economic and institutional incentives that promote rapid timber harvest, agricultural conversion practices, and the local, regional, and global environmental economic costs of rainforest loss are well understood.[16] There is a huge body of popular and scholarly literature which extols the virtues of rainforest conservation[17] and condemns rapid exploitation for short term economic profit. But, like over-fishing of straddling ocean stocks, the problem persists. Effective external legal restraints to counter national decisions that permit rapid forest exploitation do not exist. Nor, as environmentalists urge, have we replaced the current market incentives to convert land to agricultural use, to harvest timber, or to allow mineral exploration with sufficiently powerful alternatives that will allow for the conservation of the forest for the benefit of future generations.[18]

This Article examines the failure of the international legal system to develop an effective legal response to the scientific imperative that nations with rich tropical (and temperate) forest resources replace rapid and destructive exploitation with management strategies that benefit both present and future generations of humankind. The basic argument is that classic international law precludes the development of effective direct international legal restraints because it effectively shields internal policies, such as natural resource management decisions from external standards regardless of the international spillovers. International law cannot solve the host countries' lack of capacity to control

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14. *See* Lee P. Breckenridge, *Protection of Biological and Cultural Diversity: Emerging Recognition of Local Community Rights in Ecosystems Under International Environmental Law*, 59 TENN. L. REV. 735, 745 (1992); Dinah Shelton, *Fair Play, Fair Pay: Preserving Traditional Knowledge and Biological Resources*, 5 Y.B. INT'L ENVTL. L. 77, 83 (1994). *See also* KENTON MILLER & LAURA TANGLEY, TREES OF LIFE: SAVING TROPICAL FORESTS AND THEIR BIOLOGICAL WEALTH 117–20 (1991). Students of environmental ethics purport to find the basis of a sustainability ethic in indigenous hunting and gathering survival practices. For example, a leading environmental philosopher argues that the world views and subsistence practices of various Amazon tribes with the hope that traditional practices can be applied to create "sacred" extractive reserves managed by indigenous peoples. *See generally* J. BAIRD CALLICOTT, EARTH'S INSIGHTS: A SURVEY OF ECOLOGICAL ETHICS FROM THE MEDITERRANEAN BASIN TO THE AUSTRALIAN OUTBACK 133–55 (1994). The problems of protecting the indigenous people's continued land-based centered culture are well surveyed by Balée and Kahn. William L. Balée & Marina Kahn, Addresses at the symposium *Sustainable Development in Latin American Rainforests and the Role of Law* (March 1, 1996) (notes on file with the *Texas International Law Journal*); *see also* William L. Balée, *Lanuguage, Law, and Land in Pre-Amazonian Brazil*, 32 TEX. INT'L L.J. 123 (1997). The history of the invasion of the Amazon by the Portuguese and Brazilians is told in JOHN HEMMING, AMAZON FRONTIER: THE DEFEAT OF THE BRAZILIAN INDIANS (1987).

15. The transformation of American tropical rainforests began with the sugar plantation economy in the Caribbean and Brazil in the 16th century and continued with the coffee and fruit plantations of the 19th century. Timber exploitation began with the mahogany exploitation in the 19th century and rapidly accelerated after World War II. *See* Richard Tucker, *Five Hundred Years of Tropical Forest Exploitation*, *in* LESSONS OF THE RAINFOREST, *supra* note 3, at 39. For a concise discussion on the lasting environmental impacts of the creation of modern colonial empires or dependent agricultural nations, including those in South America, see CLIVE PONTING, A GREEN HISTORY OF THE WORLD: THE ENVIRONMENT AND THE COLLAPSE OF GREAT CIVILIZATIONS 254–58 (1991).

16. *See, e.g.*, Todd K. Martens, *Ending Tropical Deforestation: What is the Proper Role of the World Bank?*, 13 HARV. ENVTL. L. REV. 485 (1993).

17. *See generally* ADRIAN FORSYTH & KENNETH MIYATA, TROPICAL NATURE (1984); THE LAST RAINFORESTS: A WORLD CONSERVATION ATLAS, *supra* note 5; LESSONS OF THE RAINFOREST (Suzanne Head & Robert Heinzman eds., 1990); THE RACE TO SAVE THE TROPICS (Robert Goodland ed., 1990); Alan Grainger, *The State of the World's Tropical Forests*, 10 ECOLOGIST 6 (1980).

18. *See generally* EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY (1989) [hereinafter WEISS, IN FAIRNESS TO FUTURE GENERATIONS]. See notes 186–187, *infra*, for further discussion of the duty to preserve rainforests for the benefit of future as well as existing generations.

destructive uses.[19] If tropical rainforest destruction is to be replaced with sustainable forest use practices, the primary implementation burden falls *on* the host countries. However, international law can perhaps make a modest contribution to the development of indirect restraints which can influence and reinforce both international and domestic rainforest conservation policies by providing a standard that can measure specific actions, serve as a deterrent to the adoption of destructive policies, and provide a basis for internal and external sanctions.

Rainforest destruction is the product of national policies driven by internal and well as external forces. The main determinants of forest exploitation are population pressures and national development and settlement policies. The creation of counterincentives to the historic pattern of underregulated exploitation involves the highly politically sensitive issues of population control and distribution, economic growth rates, and property entitlement regimes. For example, Brazilian rainforest destruction is the direct result of government decisions during the military dictatorship, supported by multinational development banks and aid programs[20] that subsidized cattle ranching as one of the several strategies to break the country's historic reliance on monoculture[21] and encouraged population resettlement to relieve poverty in the populous but drought-prone adjoining Nordeste (Northeast) region.[22] At a deeper level, Amazonia is Brazil's frontier and symbolizes the nation's efforts to create a non-European national identity.[23] Thus, for the foreseeable future, there will be pressure to exploit this resource.[24]

The history of the causes of rainforest destruction teaches that effective remedies to modify forest management practices cut to the core of national civilian and military prerogatives. For this reason, rainforest destruction must be approached indirectly through

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19. *See* Soussan & Millington, *supra* note 7, at 87–89.

20. *See* BRUCE RICH, MORTGAGING THE EARTH: THE WORLD BANK, ENVIRONMENTAL IMPOVERISHMENT, AND THE CRISIS OF DEVELOPMENT 99–100 (1994); Bruce M. Rich, *The Multilateral Development Banks, Environmental Policy, and the United States*, 12 ECOLOGY L.Q. 681, 688–703 (1985). In 1990, subject to vested rights, Brazil revoked the income tax exemption and other tax subsidies for companies which established agricultural or industrial enterprises in Amazonia. *See* Lei No. 8.302, de 12 de abril de 1990, D.O.U. de 13.04.1990, *reprinted in* 2 COLEÇÃO DAS LEIS 793 (1990).

21. *See* Vicente de P.Q. Nogueira, *Ecological Aspects of Development in Amazonia*, *in* AMAZONIA AND SIBERIA: LEGAL ASPECTS OF THE PRESERVATION OF THE ENVIRONMENT AND DEVELOPMENT IN THE LAST OPEN SPACES 1, 6–7 (Michael Bothe et al. eds., 1993) [hereinafter AMAZONIA AND SIBERIA]. For good summaries of the forces that promote the settlement and development of Brazil's Far West frontier, see also E. BRADFORD BURNS, A HISTORY OF BRAZIL 485–87 (3d ed. 1993) and Peter C.L. Roth, *The Emerging Role of the Extractive Reserve in the Enforcement of Brazilian Deforestation Controls*, 2 COLO. J. INT'L ENVTL. L. & POL'Y 247, 251–52 (1991).

22. After the 1970 drought in the Nordeste, President Emílio Garrastazú Médici adopted the Programa de Integração Nacional [Program of National Integration] (PIN) program to open up "empty spaces" of the Amazon under the slogan "[M]en without land in the Northeast and land without men in Amazonia," *quoted in* THOMAS E. SKIDMORE, THE POLITICS OF MILITARY RULE IN BRAZIL 1964–1985, at 145 (1988). See Antonio Magalhães & Pennie Magee, *The Brazilian Nordeste (Northeast)*, *in* DROUGHT FOLLOWS THE PLOW 59 (Michael H. Glantz ed., 1994) for a critical analysis of the drought reduction program.

23. *See* JOSÉ HONÓRIO RODRIGUES, THE BRAZILIANS: THEIR CHARACTER AND ASPIRATIONS 76–88 (Ralph Edward Dimmick trans., 1967) (noting that, unlike the United States, Brazil's population remains concentrated along the Atlantic coast and thus effective occupation of its vast thinly populated territories has always been a national aspiration). Prior to the Vargas regime, 1930–54, the country tried to consolidate the development of the East and to encourage gradual dispersion to the West. Vargas and his successors, aided by American and European visions of the promise of the Amazon, identified "the true path of Brazilian nationality" with the rapid settlement of the West. The problem is complicated by efforts to redress the regional political and economic imbalance enjoyed by southern Brazil. The frontier settlement justification is criticized for its insensitivity to native peoples and the failure of the country to achieve sustainable development and equitable land distribution in the south in Lothar Brock & Stephan Hessler, *The Colonization of Amazonia: Constellation of Interests and Conflict Potentials*, *in* AMAZONIA AND SIBERIA, *supra* note 21, at 57, 59, 63–64, 67–68.

24. Marina Kahn, Address at the symposium *Sustainable Development in Latin American Rainforests and the Role of Law* (March 1, 1996) (notes on file with the *Texas International Law Journal*).

principles and institutions that are superimposed on classic international law sovereignty principles[25]—although this is still a radical reorientation of the role of international law. Unlike the objective of classic international law, international environmental law—along with human rights law—seeks to influence *internal* national decisions.[26] In economic terms, law must help rainforest nations to find a way to capture the positive externalities of rainforest conservation.[27] A recent estimate of the annual value of rainforest destruction is $10 billion.[28] The creation of internal incentives must be undergirded, however, by legal principles which provide some promise of penalizing unsustainable management.

Despite all its weaknesses, the best hope for this project is to use the emerging international principle of sustainable development as a benchmark against which both indirect incentives and prohibitions to better manage rainforest resources can be measured. Only the concept of sustainable development holds out the possibility of addressing the legitimate development needs of the rainforest host nations within an international environmental legal framework. Sustainable development has the potential to evolve into a binding legal principle that applies to both external and internal management decisions,[29] and it can support the modification of existing principles of international law which hinder rainforest conservation. Sustainable development is superior to the developing countries' post-Stockholm argument that they are entitled to exploit their resources for their own benefit as compensation for the legacy of the political or economic dependence in the nineteenth century.[30] It is equally superior to the romantic "green" ethics of subsistence existence.[31]

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25. *See* Guido F.S. Soares, *The Impact of International Law on the Protection of the Amazon Region and the Further Development of Environmental Law in Brazil, in* AMAZONIA AND SIBERIA, *supra* note 21, at 208, 220.

26. *See, e.g.*, UNITED NATIONS, GENERAL ASSEMBLY, INTERGOVERNMENTAL NEGOTIATING COMMITTEE, ELABORATION OF AN INTERNATIONAL CONVENTION TO COMBAT DESERTIFICATION IN COUNTRIES EXPERIENCING SERIOUS DROUGHT AND/OR DESERTIFICATION, PARTICULARLY IN AFRICA, U.N. Doc. A/AC.241/27 (1994), *reprinted in* 33 I.L.M. 1328 (1994) (providing a good example of the emphasis on the creation of internal regional and local solutions to a transnational problem). International natural resource management conventions and treaties increasingly adopt a bottom up approach. *See, e.g.*, Kyle W. Danish, *International Environmental Law and the "Bottom-Up" Approach: A Review of the Desertification Convention*, 3 IND. J. GLOBAL LEGAL STUD. 133 (1995).

27. *See* Robert A. Madsen, *Of Oil and Rainforests: Using Commodity Cartels to Conserve Depletable Natural Resources*, 7 INT'L. ENVTL. AFF. 207, 221–22 (1995). *Cf.* Candace Slater, *Amazonia as Edenic Narrative, in* UNCOMMON GROUND: TOWARD REINVENTING NATURE 114, 126 (William Cronon ed., 1995) (criticizing the popular image of rainforests as edenic wildernesses because "[t]he single most important difference between a rainforest and a wilderness resides in the former's greater openness to use").

28. *See* Madsen, *supra* note 27, at 220–21 (arguing that the choice is between the sale of positive externalities such as carbon absorption sinks and pharmaceutical knowledge to developing countries and the creation of a timber cartel by tropical hardwood producing countries).

29. *See* Nagendra Singh, *Foreword* to EXPERTS GROUP ON ENVIRONMENTAL LAW OF THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT: LEGAL PRINCIPLES AND RECOMMENDATIONS at ix, xi–xii (1987). Sustainable development is currently regarded as soft law. *But cf.* John Batt & David Short, *The Jurisprudence of the 1992 Rio Declaration on Environment and Development: A Law, Science, and Policy Explication of Certain Aspects of the United Nations Conference on Environment and Development*, 8 J. NAT. RESOURCES & ENVTL. L. 229, 231 (1993) (using the McDougal school of international law to argue that the Rio Declaration represents "a register of world community legislative intent."). See text at notes 90–93, *infra*, for a discussion of the strengths and weaknesses of the concept of sustainable development.

30. The independence of Latin American countries did not change their role as suppliers of raw materials to more developed nations in exchange for manufactured goods. *See* JOSÉ MARIA BELLO, A MODERN HISTORY OF BRAZIL 1889–1964, at 16 (James L. Taylor trans., 1966). For an extremely insightful analysis of the reasons that the North-South debate has remained unchanged since it surfaced at the 1972 Stockholm Conference, see Adil Najam, *An Environmental Negotiation Strategy for the South*, 7 INT'L ENVTL. AFF. 249 (1995).

31. *See* MARTIN W. LEWIS, GREEN DELUSIONS 250 (1992) (surveying pro and anti-environmental positions on third world development and arguing that the eco-radical argument against growth "undermines our best chance of salvaging the earth."); *see also* Slater, *supra* note 27.

II. THE WALL OF NATIONAL SOVEREIGNTY

A. The Right to Develop: A Modern Manifestation of Sovereignty

Focusing on the modification of internal national behavior is always dicey. This is especially true for rainforest destruction. Absolute exclusive territorial sovereignty is commonly identified as the major barrier to effective rainforest management. Sovereignty claims allow nations to shield internal development and management decisions from international law restraints by equating exclusive territorial sovereignty with an absolute right to develop their natural resources. Rapid and intensive exploitation is an exercise of the right to develop—a right which has become an integral part of postcolonial international law.[32] The recognition of national sovereignty and the derivative right to develop is embedded in every modern environmental and natural resources management declaration and convention relevant to rainforest management. The right has been grounded in either "colonial" concepts of sovereignty or the postcolonial principle of the duty of equity owed by the North to the South.[33] Although some rainforest nations have moved away from the heavily subsidized economic development schemes that excited the World Bank's attention in the 1980s, the tension between sovereign (internal) and international (external) management strategies remains the nub of the inability to subject rainforest management to an international legal regime.

Classic international law supports the right to develop because it concerns itself only with *minimal* standards of *external* conduct among nations. As long as nation-states respect the territorial sovereignty of other nations, they have the exclusive power to manage natural resources within their borders.[34] Absolute territorial sovereignty reached its apogee in the late nineteenth and early twentieth centuries, when it was accepted as *the* international organizing principle.[35] The major twentieth century application of this "grundnorm" is the developing world's claim of a right to develop as incidental to the right of self-determination.[36] Since World War II, self-determination has been expanded to encompass a right to exploit natural resources and provides the foundation for the customary right to develop.[37] Western nations initially opposed this claimed right in order to protect foreign mineral concessions, but the Rio Declaration adopted it by consensus for the first time in an

32. *See generally* T. O. ELIAS, NEW HORIZONS IN INTERNATIONAL LAW 201–49 (1993).

33. *See* Edith Brown Weiss, *International Environmental Law: Contemporary Issues and the Emergence of a New World Order*, 81 GEO. L. J. 675, 702 (1993) [hereinafter Weiss, *International Environmental Law*].

34. "The sovereignty and exclusive jurisdiction of the 190 or so states over their territory means, in principle, that they alone have the competence to develop policies and laws in respect of the natural resources and the environment of their territory, which comprises: (a) the land within its boundaries, including the subsoil . . . ." PHILIPPE SANDS, 1 PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW 15 (1995).

35. *See generally* MALCOLM N. SHAW, INTERNATIONAL LAW 1–38 (2d ed. 1986). For a modern formulation of the principles of sovereignty, *see* IAN BROWNLIE, PRINCIPLES OF PUBLIC INTERNATIONAL LAW 287–90 (3d ed. 1979).

36. After World War I, the right of self-determination replaced the 18th and 19th century right to colonize and exploit. *See generally* P.R. ANAND, CONFRONTATION OR COOPERATION: INTERNATIONAL LAW AND DEVELOPING COUNTRIES (1987).

37. The basis of custom is state practice accepted as *opinio juris*. The state practice requirement is easily satisfied and both unilateral declarations and international agreements such as those negotiated at Stockholm and Rio support the conclusion that states accepted the right to develop, and the corollary duty not to interfere in the decisions of other states, as a legal norm. The one counterargument to the universality of this norm is the persistent objector principle. To protect the interests of multinational oil and other extractive industries, the United States has consistently objected to the right to develop. *See* SANDS, 1 PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW, *supra* note 34, at 118–25.

international document. Principle 3 states that "[t]he right to develop must be fulfilled so as to equitably meet developmental and environmental needs of future generations."[38]

From many modern perspectives, sovereignty and corollary exclusive rights are archaic remnants of a decaying and accidental international order. There is an increasing consensus among students of international relations that absolute territorial sovereignty is no longer a functional organizing concept given the interdependencies of the modern world. Private global trading, communications, cultural and scientific networks, and the liberal ideals that they support have eroded the vitality of the concept.

The environmental case against exclusive national sovereignty rests on the scientific and economic argument that unacceptable levels of transboundary and global spillovers exist, as well as on the argument that the activities that cause the spillovers violate neo-Kantian imperatives. The idea of neoKantian ethics has been attractive to environmentalists because it allows them to present the "imperative" of environmental protection as a categorical moral imperative.[39] Although Kant's philosophy offers no support for their argument,[40] environmentalists have tried to extend his contention that moral law extends without distinction to all persons, and thus all persons are entitled to equal rights. The neo-Kantian environmental ethics proceed from the proposition that the entire planet, including all living and nonliving forms, is within a moral sphere and thus enjoys some form of "rights."

On both historical and instrumental grounds, the case is a strong one. Historically, rainforest destruction is a consequence of the nation-state, which arose in Europe by default after the Thirty Years' War. Both the continent's great powers and the Catholic Church were forced to recognize the permanent existence of separate small, as well as large, Catholic and Protestant nations. The great project of international law has been to promote the peaceful coexistence among these accidental territorial divisions and, subsequently, the orderly carving up of the globe in the wake of the failures of the Spanish, Portuguese, English, French, Dutch, German, and Russian colonial empires.[41] This effort has only highlighted the importance of the weakness of the idea of sovereignty when applied to nations with varying capacities to manage their territory and peoples. To accomplish the peaceful transition from a colonial world to a world of independent states, international law reversed the legal order of the Roman Empire: territorial prerogatives are the norm and universal rules the exception.[42] Since World War II, international law has tried to return to universal rules centered around the protection of human dignity,[43] and, more recently, centered around the ecological integrity of the planet.

Nonetheless, in light of the history of sovereignty claims and the nature of rainforest management, the project to erode national sovereignty over forests is a formidable one.

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38. UNITED NATIONS, CONFERENCE ON ENVIRONMENT AND DEVELOPMENT, THE RIO DECLARATION OF ENVIRONMENT AND DEVELOPMENT, princ. 3, U.N. Doc. A/CONF.151/5/Rev. 1 (1992), *reprinted in* 31 I.L.M. 874, 877 (1992) [hereinafter RIO DECLARATION].

39. Immanuel Kant developed his theory that morality precedes from prior principles in his masterwork, A CRITIQUE OF PURE REASON. I have relied on NORMAN KEMP SMITH, A COMMENTARY ON KANT'S "CRITIQUE OF PURE REASON" 570–76 (1984) for my imperfect understanding of Kant's philosophy.

40. Many in the environmental community have sought to establish neo-Kantian ethics, although Kant's philosophy provides no support for nonanthropocentric ethics. *See* LUC FERRY, THE NEW ECOLOGICAL ORDER (Carol Volk trans., 1995); Tarlock, *Environmental Law: Science or Ethics?*, *supra* note 10.

41. *See generally* JOHN HERMAN RANDALL, THE MAKING OF THE MODERN MIND: A SURVEY OF THE INTELLECTUAL BACKGROUND OF THE PRESENT AGE 194–201 (1926) (providing a concise and elegant survey of the intellectual, historical, and economic currents that produced the modern theory of international law).

42. *See* LAURI HANNIKAINEN, PEREMPTORY NORMS (JUS COGENS) IN INTERNATIONAL LAW 17–18 (1988).

43. *See generally* Richard Falk, *The Interplay of Westphalia and the Charter of Conceptions of International Legal Order*, *in* INTERNATIONAL LAW: A CONTEMPORARY PERSPECTIVE 2, 116 (Richard Falk et al. eds., 1985).

Unlike the protection of human rights, rules with a similar degree of uniform application and specificity cannot be developed for biodiversity protection because of the unique scientific and institutional aspects of rainforest management. Environmentalism envisions a cooperative international order organized around universal ecosystem protection norms, but no clear alternative to exclusive sovereignty has emerged.[44] Thus, the concept endures as the major theoretical objection to international control of rainforests.[45] The basic objective is simple: shared control over rainforest management between the nation-state and private and governmental non-national representatives of the "international community" so that international norms can be applied to internal natural resources decisions.

The argument for shared control proceeds in three stages: (1) the recognition of limitations on the use of a state's territory, (2) the expansion of the category of common or shared resources to include resources conventionally classified as exclusive, and (3) the creation of new norms of conduct that can be adapted to apply to specific state activities that cause internal as well as external adverse environmental consequences. The concept of sustainable development is the current consensus candidate for the new norm. It allows for modification of exclusive sovereignty within the context of classic theories of sovereignty, but it draws support from counter-traditions in international law; specifically, the Grotian vision of international law as a progressive source of idealism, individual as well as state rights,[46] and the recognition that non-state actors (such as international organizations and non-governmental organizations) have legitimate interests in the formulation and application of international law.[47]

B. Limitations on the Use of Sovereign Resources

The first part of the argument applies the exception to exclusive state sovereignty (abuse of rights or territory) to rainforest destruction to show that national rainforest use policies are not exclusively an internal sovereign prerogative. States have a duty not to allow their territory to be used for acts, such as pollution, that harm other states. The principle was articulated in the 1941 *Trail Smelter Arbitration* between Canada and the United States, and the resulting customary rule is the foundation of modern international environmental law:

> Under the principles of international law . . . no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of

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44. The most difficult problem in analyzing the erosion of exclusive sovereignty is determining the current status of the international order on the time line of institutional evolution. For a lucid but highly theoretical argument that the seeming continuation of the 19th century pattern of carving up the globe and the corresponding defense of the concept by all national states masks the demise of the concept and its replacement by new imperial norms, see JEAN-MARIE GUÉHENNO, THE END OF THE NATION STATE (Victoria Elliott trans., University of Minnesota Press 1995) (1993). *But cf.* MICHAEL ROSS FOWLER & JULIE MARIE BUNCK, LAW, POWER, AND THE SOVEREIGN STATE: THE EVOLUTION AND APPLICATION OF THE CONCEPT OF SOVEREIGNTY (1995) (discussing the continuing importance of sovereignty and the sovereign state).

45. Brazil continues to invoke this rationale as a basis for refusing to commit to the negotiation of an international forest treaty. *See Environmental Events in Latin America, 1995*, 6 COLO. J. INT'L ENVTL. L. & POLICY 367, 386 (1995).

46. *See* Hersch Lauterpacht, *The Grotian Tradition in International Law, in* INTERNATIONAL LAW: A CONTEMPORARY PERSPECTIVE, *supra* note 43, at 10.

47. *See generally* LAKSHMAN D. GURUSWAMY ET AL., INTERNATIONAL ENVIRONMENTAL LAW AND WORLD ORDER 9–43 (1994) (reviewing the different answers to the question: Is international law in the environmental context?).

serious consequence and the injury is established by clear and convincing evidence.[48]

Trail Smelter is a major qualification of the principle of exclusive territorial sovereignty that extends to the management of natural resources, but it is still of limited practical importance to the issues of sustainable rainforest use for two primary reasons. First, the principle assumes that provable transboundary air and water pollution, not the unsustainable exploitation of sovereign natural resources, is the model of an international environmental violation. The high standard of proof of injury, coupled with the inherent difficulties of any kind of international environmental adjudication, make the principle an oft cited but seldom applied one. The pollution model can be adapted to rainforest destruction, but the limits of the *Trail Smelter* principle render it virtually ineffective.[49] Extreme forest destruction might trigger a *Trail Smelter* lawsuit if it resulted in water pollution that reached a downstream state. The theory would be that a state's forest management practices constitute "non-point" source pollution. Such a suit would involve the law of international water courses, and an upstream state may make a reasonable level of pollution defense.[50] The *Trail Smelter* qualification is of limited utility to forest destruction because the direct damage is often internal, and the indirect damage, such as the reduction of carbon sinks, is *damnum absque injuria* in the absence of an effective global climate change legal regime. The second limitation is that tort-based liability for extraterritorial injury does not disturb the underlying ownership and control rules and therefore provides few, if any, incentives to modify fundamental natural resources policies. If a state is found liable for transboundary pollution, compensation is the primary remedy. This remedy does not address the underlying problem. If rainforest destruction is to be limited, forest states must change their timber management and settlement policies. Again, lawsuits are an extremely indirect means to this end. Still, *Trail Smelter* has formed the basis for the emerging international environmental law regime that is premised on non-exclusive territorial sovereignty.[51]

C. *What Is Commons?*

The traditional law of state responsibility must be expanded to include internal state duties toward new common property resources if rainforests are to be subject to any

48. Trail Smelter (U.S. v. Can.), 3 R.I.A.A. 1907, 1965 (1941). The International Court of Justice adopted a similar formulation in the *Corfu Channel Case*, (U.K. v. Alb.), 1949 I.C.J. 8, 22 (Apr. 9) and all subsequent soft law declarations of international environmental rights and duties reassert the duty not to allow their territory to be used for acts, such as pollution, that harm other states. See SANDS, 1 PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW, *supra* note 34, at 186–87, for a discussion of the tension between the *Trail Smelter* principle and the right to develop.

49. *Cf.* Daniel Bodansky, *Customary (and Not So Customary) International Environmental Law*, 3 IND. J. GLOBAL STUD. 105 (1995), which questions whether there is a customary duty not to cause transboundary pollution. *See also Developments in the Law—International Environmental Law*, 104 HARV. L. REV. 1484, 1500–15 (1991) for a highly critical but realistic analysis of the ineffectiveness of international abuse of rights liability regimes to influence environmentally destructive state behavior.

50. For a discussion of the efforts of the International Law Commission to meld the principle of equitable apportionment, based on the reasonableness of all uses, and modern pollution control ideas that discourage all waste discharge, see A. Dan Tarlock, *International Water Law and the Protection of River System Ecological Integrity*, 10 B.Y.U. J. PUB. L. 181 (1996). In addition to the reasonable use defense, THE EARTH SUMMIT AGREEMENTS 36 (Michael Grub et al. eds., 1993) suggests that a rainforest state could make a soft state defense, that it lacks effective control over the destructive activity. In addition, state responsibility depends on an illegal act of a state organ and not all rainforest destruction can be linked to official action. State responsibility is broad enough to include state neglect of unlawful and violent behavior. *See* BROWNLIE, *supra* note 35, at 452–54.

51. *See* SANDS, 1 PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW, *supra* note 34, at 186–94.

meaningful international legal regime. To this end, forests must be recharacterized from exclusive to shared resources. The scientific case for recognizing forests as shared resources rests on their regional and global functions.[52] Regionally, tropical forests are rain machines that recycle water back to the atmosphere, and "[w]ith deforestation, this vigorous recycling of water will weaken and could lead to lower rainfall in the region."[53] Globally, forests are biodiversity "reserves" and carbon sinks. If the balance between the uptake and release of carbon is altered, more carbon may be released into the atmosphere than is stored, and global warming would accelerate.[54]

International law has traditionally recognized that a limited class of common resources outside the exclusive control of any state, such as the high seas, are not subject to exclusive sovereignty claims.[55] Commons have been restricted to areas such as the seas and skies, where effective national control was inefficient and costly to police. On one level, the classification of rainforests as commons is not a desirable result. The classic nonexclusive license to exploit given to all nations is a tragedy of the commons as the current over-fishing crisis illustrates. To prevent future tragedies, environmental commentators have been attracted to the emerging Antarctic Treaty regime and Malta's contribution to the law of the sea which reformulated the idea of commons as equitable international restraint on resource exploitation.[56] Malta proposed that the high seas and seabed be declared the common heritage of mankind. During the ensuing United Nations debate, common heritage was softened to common concern, but the seed of the idea of terrestrial commons subject to stewardship regimes was planted.

Common heritage or concern has two implicit restrictions on resource use. First, all members of the international community have an interest in the resource. Second, it follows that exploitation decisions must be measured against their impacts on other members of the international community. The closest nonmarine legal regime to adopt this principle is the Antarctic treaty regime, and "publicists" have argued that the principle can be extended to whales, wildlife,[57] and biodiversity. The Court of Justice of the European Communities has described wild birds as "a case where the management of the common heritage is entrusted to the member states in their respective territories."[58] But, tropical countries are willing to play this reclassification game only in return for North-South wealth and technology transfers. The 1983 International Tropical Timber Agreement and the non-legally binding 1992 Forest Principles adopted by the United Nations Commission on Economic Development rejected the common heritage classification of forests and reaffirmed the principle of producing-state control over forests. As a leading international environmental scholar notes, "[t]he Principles do not 'internationalise' forest issues, or state that forests are 'a common concern of mankind.'"[59]

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52. *See* ORAN R. YOUNG, INTERNATIONAL GOVERNANCE: PROTECTING THE ENVIRONMENT IN A STATELESS SOCIETY 19–23 (1994) (classifying rainforest destruction as a transboundary externality).

53. SILVER & DEFRIES, *supra* note 4, at 121.

54. *See id.* at 121–22.

55. *See* YOUNG, *supra* note 52, at 19–26 (distinguishing among four types of international governance issues relating to the environment: (1) international commons, (2) shared natural resources, (3) transboundary externalities, and (4) linked issues such as the relationship between national energy policy and global climatic response).

56. *See generally* INTERNATIONAL ENVIRONMENTAL LAW ANTHOLOGY 31–35 (Anthony D'Amato & Kirsten Engel eds., 1996).

57. *See* Michael J. Glennon, *Has International Law Failed the Elephant?*, 84 AM. J. INT'L L. 1, 30–31 (1990).

58. Case C-339/87, Commission v. The Netherlands, 1990 E.C.R. 851, 885–86, 2 C.M.L.R. 360, 386 (1993) (interpreting the 1979 Wild Birds Directive). *See* SANDS, 1 PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW, *supra* note 34, at 439–42.

59. *Id.* at 408.

Forests are not in fact true commons, and thus, both politically and scientifically, rainforests are a harder case compared to the Antarctic and marine mammals. Forests lack the characteristic of true commons because they can effectively be exploited by individual nations. For both scientific and political reasons, they can at best be recharacterized as shared or partial commons.[60] Two international law scholars have recently suggested that traditionally national resources such as rainforests should be characterized as of "common concern to humankind" to make clear "that the concept of common concern, unlike the related notion of common heritage, does not purport to render the resource itself 'common.'"[61] Despite the continued resistance of host countries to this idea, there is modest movement in this direction. Some rainforest governments have recognized the legitimacy of non-national interests in their forest resources. Guyana recently set aside 37,000 hectares of rainforest as a world study area and acknowledged the interest of the international community in its internal decisions. Under intense external (and, in some cases, internal) pressures, developing countries have shifted the demand for an absolute right to a qualified right to exploit. For example, the 1989 soft law Amazon Declaration reaffirms "the sovereign right of each country to manage freely its natural resources, bearing in mind the need for the economic and social development of its peoples and the adequate conservation of the environment"[62] consistent with the argument of developing countries that they should be subjected to "common but differentiated responsibilities."[63]

In recognition of the need for equity between the developed and developing world, for the foreseeable future, forests will remain at best commons shared between the international community and the host nation. To developing countries, equity has traditionally been defined as the equal right to exploit resources.[64] The need for equity is acute with respect to rainforests because rainforests are unevenly distributed throughout the world, are almost exclusively concentrated in developing countries, and are in the parts of the country subject to intense development pressures from both external and internal forces. Latin America, for example, contains fifty-four percent of the world's rainforests.

If shared sovereignty is recognized, it can be the basis for both procedural and substantive limitations on national prerogatives that can provide standards to judge domestic rainforest use and management decisions. The concept supports the post-*Trail Smelter* procedural and substantive duties that modern international law seeks to impose on state development. A number of treaties and soft law declarations impose duties of impact assessment, cooperation, mitigation, and prevention of the risks of future harms. Procedural duties are easier to impose because there is a broader consensus for them and because states retain the power to make the final use and management decisions. Substantive duties are more difficult because of the consensus requirement. The most promising but disputed substantive natural resources protection duty is the precautionary principle. This principle adopts the substitution of risk for provable harm that underlies U.S. and European toxic pollutant regulation and projects it as a general international duty between states and *erga*

60. *Compare* WEISS, IN FAIRNESS TO FUTURE GENERATIONS, *supra* note 18, at 224 ("Forests must be recognized as having elements of common patrimony."), *with* Roseann Escbach, Comment, *A Global Approach to the Protection of the Environment: Balancing State Sovereignty and Global Interests*, 4 TEMP. INT'L & COMP. L.J. 271 (1990).

61. Jutta Brunee & Stephan J. Toope, *Environmental Security and Freshwater Resources: A Case for International Ecosystem Law*, 6 Y.B. INT'L ENVTL. L. 41, 73 (1995).

62. UNITED NATIONS, GENERAL ASSEMBLY & ECONOMIC AND SOCIAL COUNCIL; THE AMAZON DECLARATION, para. 4, U.N. Doc. A/44/275 (1989).

63. *See* RIO DECLARATION, *supra* note 38, princ. 3. *See, e.g.*, Daniel Barstow Magraw, *Legal Treatment of Developing Countries: Differential, Contextual, and Absolute Norms*, 1 COLO. J. INT'L ENVTL. L. & POL'Y 69, 72 (1990) (illustrating the developing countries' argument with a hypothetical); *see generally* Cheng Zheng-Kang, *Equity, Special Considerations, and the Third World*, 1 COLO. J. ENVTL. L. & POLICY 57 (1990).

64. *See* Weiss, *International Environmental Law*, *supra* note 33, at 702–07 (1993).

omnes.[65] Precaution is a logical response to a science-based legal regime such as international environmental law. If the problem is in fact to be mitigated, serious risks such as ozone depletion and global warming must be regulated before the confirming evidence can be generated.

Commentators assert that the precautionary principle is emerging out of recent regional and global agreements[66] such as the Ozone Convention and other regional hazardous waste treaties. The precautionary principle posits that states have a duty to take "remedial action even in the absence of provable environmental harm, simply on the evidence of significant risk thereof."[67] The principle is still vague and is not well integrated with the law of state responsibility for transboundary environmental damage. The duty has been characterized as a secondary limitation on a state's obligation not to cause transboundary harm or use more than its fair share of common resources.[68] The precautionary principle has been extended from pollution prevention to biodiversity conservation and is incorporated into the preamble of the Biodiversity Convention, although the crucial burden of proof issue is unresolved. The Convention can be characterized as a recognition that a state has a duty to practice sustainable development for internal as well as external reasons. However, at the present time, this seems too radical an extension of the concept. At most, a state probably has a duty to avoid foreseeable, significant risks to other states.[69] In short, the precautionary duties to conserve biodiversity will be less than those to prevent pollution because we know less about the transfrontier and global risks posed by biodiversity loss. But, the principle puts some pressure on nations to choose sustainable development projects that have a substantial biodiversity conservation component.[70]

The final stage in the development of an international environmental law regime for rainforests is the creation of universal obligations that trump sovereign prerogatives. Principle 21 of the Stockholm Declaration is the first step in the effort to broaden the *Trail Smelter* principle. The principle states the exclusive sovereignty principle with a potentially significant expansion of the abuse of rights exception:

> States have, in accordance with the Charter of the United Nations and the principle of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas *beyond the limits of national jurisdiction.*[71]

The italicized phrase seems to adopt the principle that international duties run both to individual states and to the international community as whole. This principle is an extension of the previous customary international law, which remains locked in the state

65. *See* HARALD HOHMANN, PRECAUTIONARY LEGAL DUTIES AND PRINCIPLES OF MODERN INTERNATIONAL ENVIRONMENTAL LAW 341–45 (1994) (arguing that the precautionary principle is a logical product of the trend toward planned environmental management and that it has been so widely adopted in binding and non-binding agreements that it has become an "instant" doctrine of customary international law).

66. *See* Ellen Hey, *The Precautionary Concept in Environmental Policy and Law: Institutionalizing Caution*, 4 GEO. INT'L ENVTL. L. REV. 303, 306–07 (1992); *see also* Catherine Tinker, *Responsibility for Biological Diversity Conservation Under International Law*, 28 VAND. J. TRANSNAT'L L. 777, 797–98 (1995).

67. Günther Handl, *Environmental Security and Global Change: The Challenge to International Law*, *in* ENVIRONMENTAL PROTECTION AND INTERNATIONAL LAW 59, 99 (W. Lang et al. eds., 1991).

68. *See* Tinker, *supra* note 66, at 797–98.

69. *See id.*

70. *See* notes 104–111, *infra*.

71. UNITED NATIONS, CONFERENCE ON THE HUMAN ENVIRONMENT, DECLARATION OF THE UNITED NATIONS CONFERENCE ON THE HUMAN ENVIRONMENT, princ. 21, U.N. Doc. A/CONF.48/14 (1972), *reprinted in* 11 I.L.M. 1416, 1420 (1972).

versus state model. A state's rights have traditionally been limited to its territory or the portion of the oceans under its exclusive control.[72] Thus, standing to enforce obligations is limited to states injured by a breach of an international duty. The concept of an *actio popularis* or private attorney general action has been rejected by the International Court of Justice (ICJ),[73] although it has been endorsed in influential ICJ dissenting opinions.[74]

Classic customary international law reflects an overly narrow view of the beneficiaries of international obligations and thus needs to be expanded. The nation-state is ultimately an artificial construct with no relationship to the actual physical dimension of many global environmental problems. A nation's duties and any corresponding rights should be coextensive with the physical boundaries of the problem. The conceptual foundations of an expanded concept of duties and rights are already recognized in international law. In the *Barcelona Traction Case*,[75] the ICJ recognized the existence of "obligations of a state towards the international community as a whole"[76] distinct from those that arise between individual nation-states. These are obligations *erga omnes*. *Barcelona Traction* suggested that the duty to compensate after expropriation was such an obligation. The duty of fair compensation is ideally designated as an *erga omnes* obligation because there is widespread support for an obligation which potentially benefits all nations equally. The same logic has been extended to human rights violations, but again, the model is difficult to apply to biodiversity protection for both philosophical and scientific reasons.

In addition to the barriers erected by the state-centered system of international law, environmental values are extremely difficult for nations to accept and to integrate into any system of jurisprudence because they break with the prevailing traditions of both the Western Greco-Judeo-Christian heritage and the Enlightenment.[77] Environmentalism requires a fundamental redefinition of the relationship between individuals and the physical world. The historian Roderick Nash has tried to solve this problem with a thoughtful argument that environmental protection is a logical extension of the Enlightenment legacy of the recognition of human dignity,[78] but I am not persuaded that the analogy is right. The Enlightenment freedoms which we celebrate in our legal system are negative entitlements—freedom from state power. They can perhaps be extended to freedom from certain risk levels, but the most important environmental entitlements involve affirmative, substantive

72. *See* Pacific Fur Seal Arbitration (U.S. v. Gr. Brit.) (Aug. 15, 1893), *reprinted in* 1 JOHN BASSETT MOORE, INTERNATIONAL ARBITRATION HISTORY 755 (1898), *also reprinted in* 2[A] PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW 881 (Philippe Sands et al. eds., 1994); GATT Dispute Panel Report on United States Restrictions on Imports of Tuna, 30 I.L.M. 1594, 1621 (1991) [hereinafter Tuna Dolphin]. Article 20 of GATT allows a state to adopt health and conservation measures, but the Panel Report limited this authority to measures within the jurisdiction of the country because a broader reading would undermine the idea of GATT as a multilateral trade agreement.

73. *See* South West Africa (Eth. v. S. Afr., Liber. v. S. Afr.) (Preliminary Objections) 1966 I.C.J. 6, 47 (July 18).

74. *See* Nuclear Tests, (Austl. v. Fr.) 1974 I.C.J. 253, 369–70 (Dec. 20) (Judges Onyeama, Dillard, Jimenez de Archega and Sir Humphrey Waldock dissenting). *See* Jonathan I. Charney, *Third State Remedies for Environmental Damage to the World's Common Spaces*, *in* INTERNATIONAL RESPONSIBILITY FOR ENVIRONMENTAL HARM 149 (Francesco Francioni & Tullio Scovazzi eds., 1991); *see also* Philippe J. Sands, *The Environment, Community, and International Law*, 30 HARV. INT'L L. J. 393 (1989).

75. Barcelona Traction Company (Belg. v. Spain) 1970 I.C.J. 4, 32 (Feb. 5).

76. *Id.* at 32.

77. Students of environmental ethics have either tried to work within the western human-centered tradition or to posit that natural systems have intrinsic or nonanthropocentric value. For a recent collection of the literature, see THE ETHICS OF THE ENVIRONMENT (Andrew Brennan ed., 1995). The resolution of this dichotomy is not relevant to my point that any theory of expanded concepts of value, human or nonhuman, is a radical challenge to the international legal system.

78. *See* RODERICK NASH, THE RIGHTS OF NATURE 4 (1989).

resource allocations[79] and are thus alien to the dominant approach to environmental regulation that is essentially procedural or involves traditional negative prohibitions.[80]

III. SUSTAINABLE DEVELOPMENT: A UNIVERSAL BUT SITE-SPECIFIC BIODIVERSITY PROTECTION PRINCIPLE?

A. The Inadequacy of the International Environmental Law of Biodiversity Protection

Rainforest management is a subset of the more general problem of biodiversity protection because of the value of rainforests as biodiversity reserves. However, current international law affords limited protection to biodiversity, and the limits of this protection illustrate the difficulty of developing universal norms to prevent forest destruction. Biodiversity protection is by no means the sole concern of forest management. Parallel international forest management and biodiversity protection regimes exist,[81] but biodiversity seems the most appropriate framework in which to address rainforest destruction. The international biodiversity regime is comparatively more advanced than the forest management regime (where the immediate economic stakes are higher), and a rainforest protection scheme not centered on biodiversity maintenance would be meaningless.

Biodiversity protection has emerged as the major international conservation standard which has some potential to provide the scientifically-based principles against which domestic laws can be tested. The standard formally moved from soft to "semi-binding" law with the 1993 entry into force of the Convention on Biological Diversity adopted at the 1992 Rio de Janeiro Conference on Environment and Economic Development. Biodiversity protection is not, however, a peremptory international or national objective for two related reasons. First, the current law consists of an unintegrated mix of soft law declarations and regional initiatives directed primarily toward increasing the number of nature reserves throughout the world.[82] This objective is worthy, but it remains an extremely underdeveloped legal regime. Second, internationally and nationally, biodiversity protection takes places within the potentially inconsistent framework of the evolving concept of sustainable development. Thus, the consensus that has formed around the principle of sustainable development signals that there is an insufficient level of political as well as of scientific consensus to support the formulation of binding biodiversity norms. Unlike humans, all trees are not alike.[83] The best that we can hope for is the development of norms that sufficiently constrain the choice of alternative approaches to provide a basis to measure the domestic implementation of emerging international management norms. International biodiversity law must of necessity remain soft or semi-hard.

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79. *See generally* Joseph L. Sax, *The Search for Environmental Rights*, 6 J. LAND USE & ENVTL. L. 93 (1990).

80. For an analysis of the link between human and environmental rights that reaches the same conclusion, see Richard Desgagné, *Integrating Environmental Values Into the European Convention on Human Rights*, 89 AM. J. INT'L L. 263 (1995).

81. The international community has tried to influence national practices by the adoption of broad forest management standards, *see* notes 171–175, *infra*, and by the manipulation of trade channels, *see generally* Mara Kimmel Hoyt, *Breaking the Trade Barrier: Common Property Solutions to Tropical Deforestation*, 5 MINN. J. GLOBAL TRADE 195 (1996).

82. *See generally* SANDS, 1 PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW, *supra* note 34, ch. 10.

83. For a good presentation of this idea in the context of sustainable development, see Bryan Norton, *Sustainability, Human Welfare, and Ecosystem Health*, 1 ENVIRONMENTAL VALUES 97 (1992), *reprinted in* THE ETHICS OF THE ENVIRONMENT, *supra* note 77, at 495.

B. *What is Sustainable Development and What are Its Origins?*

In the past decade, the concept of sustainable development has gained widespread acceptance as the organizing principle for the development of new international environmental rights and duties in both developed and developing countries. Ironically, the concept of sustainability comes from earlier ecological studies of predator-prey relationships and was adopted by economists to refer to the maintenance of capital stocks over a limited time-horizon. The linkage between biodiversity conservation and sustainable development has obvious substantial implications for Latin American rainforest protection. Sustainable development has been adopted as the standard of modern international environmental law in an effort to bridge the North-South or rich-poor environmental gap that has stymied efforts to move environmentalism from a self-contained conversation among scientifically literate elites to an integral part of domestic political agendas.[84] Environmentalism divorced from the pressing issues of poverty and wealth distribution is doomed to irrelevance.[85] Principle Three adopted at the 1992 United Nations Conference on Environment and Development recognizes this reality and states that the "right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations."[86]

The current working definition of sustainable development is contained in the 1987 Brundtland report which defines it as development "that meets the needs of the present without compromising the ability of future generations to meet their own needs."[87] The Brundtland Commission's task was to break the impasse between developed and developing nations that surfaced at the 1972 Stockholm Conference.[88] The Brundtland Commission succeeded in collapsing the dichotomy between environmental protection and development to induce the developing world to accept the legitimacy of environmental protection. Rio indicated the formal success of the Brundtland Commission, thus making sustainable development *the* organizing principle for all future international efforts. However, like all compromises, the issue is whether it will actually advance the objectives of the exercise or whether it will become a meaningless post-hoc label used to justify the continuation of the status quo.

Sustainable development has been criticized as too vague to be meaningfully implemented,[89] a hopelessly romantic fantasy unsuited to a technological world that may lock many countries into subsistence economies if North-South subsidies fail to materialize,[90] and a way to subordinate environmental protection to development. A cynic might argue that its current success rests on the unspoken assumption that it will never progress to constraint on the current widespread practices of environmentally unsustainable development that exist in almost all countries at the present time. For example, the

84. *See generally* Helen Endre-Stacy, *Sustaining ESD in Australia*, 69 CHI.-KENT L. REV. 935 (1994).

85. *See* Christopher D. Stone, *Deciphering "Sustainable Development,"* 69 CHI.-KENT L. REV. 977 (1994).

86. RIO DECLARATION, *supra* note 38, princ. 3. The rapid ascent of this concept, from the 1987 Brundtland Commission Report developed in WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, OUR COMMON FUTURE (1987) to the 1992 Rio Conference, is traced in ALEXANDRE KISS & DINAH SHELTON, INTERNATIONAL ENVIRONMENTAL LAW 23–40 (1991 Supp. 1994). I have explored the issue of equity in U.S. and international environmental law in A. Dan Tarlock, *Environmental Protection: The Potential Misfit Between Equity and Efficiency*, 63 COLO. L. REV. 871 (1992).

87. WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, OUR COMMON FUTURE, *supra* note 86, at 8.

88. *See* LYNTON KEITH CALDWELL, INTERNATIONAL ENVIRONMENTAL POLICY: EMERGENCE AND DIMENSIONS 63–64 (2d ed. 1990).

89. For a good analysis of the difficulties of developing criteria to measure sustainable development see PETER BARTELMUS, ENVIRONMENT, GROWTH AND DEVELOPMENT: THE CONCEPTS AND STRATEGIES OF SUSTAINABILITY (1994).

90. *See* Ronnie D. Lipschutz, *Wasn't the Future Wonderful? Resources, Environment, and the Emerging Myth of Global Sustainable Development*, 2 COLO. J. INT'L ENVTL. L. & POL'Y 35, 45–54 (1991).

International Tropical Timber Council, which in theory exists to reverse unsustainable timber harvesting practices, has been unable to agree on a definition of the concept.[91] This inability to agree is not surprising because the major challenge posed by the theory of sustainable development has been to systematically and permanently incorporate the full environmental consequences of resource use into the modern economic concepts that help to structure the politics of resource allocation. The consequences of resource use, however, have been largely ignored except for visible pollution. Still, despite its flaws, sustainable development has displayed "legs," and has evolved from the idea that capital stocks should remain constant over time to the idea that development must not destroy the ability of the ecosystem to perform its natural functions.[92]

The United Nations Conference on Environment and Development identified the five most important principles of sustainable development as: (1) the emphasis on the quality of life rather than commodities, (2) the integration of the whole natural environment when assessing potential damage, (3) the reconceptualization of natural environments as national assets, (4) the recognition that there must be different responsibilities for developed and developing countries, and (5) the idea that all national policies should be tested against the norm of sustainability.[93]

The economic case for environmentally sustainable development of rainforests rests on two principles: (1) all uses of a forest can and should be valued, and (2) as a resource becomes scarce, its value increases over time, and therefore long-term versus short-term valuation horizons should be used.[94] The first principle is presently being implemented by the creation of green accounting procedures, which value the environment as a heritage resource and not just as components that can be exploited as commodities.[95] Green accounting procedures include the calculation of nonuse values.[96] The second principle proceeds from the propositions that the present use of natural resources should not be discounted or that the discount rate should more accurately reflect future values and the risks of future environmental damage.[97] For example, a World Bank study of a hectare of Peruvian rainforest calculated that the present value of harvesting the hardwood was $1000 but that the present value of a mix of fruit, latex, and selective timber harvesting was $6820.[98] The inclusion of non-use values into benefit-cost calculation significantly changes conventional outcomes. A contingent valuation study of the ecotourism value of the Monteverde Cloud Forest in Costa Rica produced a figure between $2.4 and $2.9 million.[99]

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91. *See* Brian F. Chase, *Tropical Forests and Trade Policy: The Legality of Unilateral Attempts to Promote Sustainable Development Under the GATT*, 17 HASTINGS INT'L & COMP. L. REV. 349, 371 (1994).

92. *See* LEWIS, *supra* note 31, at 201.

93. *See* Mukul Sanwal, *Sustainable Development, the Rio Declaration and Multilateral Cooperation*, 4 COLO. J. INT'L ENVTL. L. & POL'Y 45, 45–46 (1993).

94. For the best exposition of this argument, see generally DAVID PEARCE ET AL., SUSTAINABLE DEVELOPMENT: ECONOMICS AND ENVIRONMENT IN THE THIRD WORLD 23–56 (1990).

95. *See generally* BARTELMUS, *supra* note 89, at 31–59.

96. *See* Katherine K. Baker, *Consorting with Forests: Rethinking our Relationship to Natural Resources and How We Should Value Their Loss*, 22 ECOLOGY L.Q. 677, 707–14 (1995). *But cf.* Mark Sagoff, *Some Problems With Environmental Economics*, 10 ENVTL. ETHICS 55, 55 (1988) (criticizing the "contingent valuation method" which uses non-use values).

97. *See generally*, PEARCE ET AL., *supra* note 94, at 23–57.

98. *See* MOHAN MUNASINGHE, ENVIRONMENTAL ECONOMICS AND SUSTAINABLE DEVELOPMENT: WORLD BANK ENVIRONMENT PAPER NO. 3, at 78–79 (1993).

99. *See id.* at 82–83.

C. *The Influence of Sustainable Development on Rainforest Protection*

As previously stated, the current international framework most applicable to rainforest management is the 1992 Biodiversity Convention,[100] but this framework poses two problems for rainforest protection. First, the Biodiversity Convention only partially addresses the problems of forest management and may be superseded by other forest management agreements which are in various stages of negotiation. While the Convention remains primarily focused on the creation of nature reserves, rainforest countries need to create sustainable extractive reserves in addition to more conventional parks and preserves and to develop new forestry management practices and incentives to divert population growth from sensitive tropical areas. Second, the Biodiversity Convention is acceptable to the international community precisely because it incorporates the pro-development views of the South.[101] For this reason, the efforts to "balance" these concerns have diluted conservation duties imposed by the Convention. For example, the Preamble affirms that "the conservation of biological diversity is a common concern of mankind" rather than a common (and thus shared) heritage of mankind as some nations advocated. The Preamble therefore strongly reaffirms host country control. In addition, conservation duties are tempered by a capacity defense.

In large measure, the weakness of the Biodiversity Convention reflects the unwillingness of the North to subsidize protection efforts in the South. Some modest redistribution efforts are underway, but they are small and unproven compared to the South's resource demands. The history of an Ecuadorian timber harvesting project is instructive. In 1993, the Global Environmental Facility (GEF) withdrew a previous commitment to fund a carbon sequestration and sustainable forestry project in northwestern Ecuador.[102] The plan, Ecoforest 2000, was basically a typical modern land development "deal" to allow the exploitation of environmentally sensitive land. In return for the right to harvest most of the available timber, the proposed project beneficiary would create a small nature reserve and reforest adjacent degraded land. Initial project reviews were favorable, but the GEF withdrew its support over concerns about the loss of regional biodiversity and the lack of participation by indigenous peoples.[103] Ecoforest 2000's fate illustrates the scientific and economic tensions inherent in sustainable development as well as the institutional problems biodiversity protection often raises.

The Biodiversity Convention does, however, support rainforest conservation. The Convention's basic contributions to rainforest management are the adoption of an ecosystem approach to protection, the articulation of biological conservation as a national mandate,[104] and the preference for *in situ* rather than *ex situ* conservation.[105] The main thrust of the Convention is to encourage countries to establish a system of biodiversity reserves with adequate perimeter protection.[106] It also provides a set of benchmarks against which national plans and programs can be measured.[107] States have a duty to inventory and

100. Convention on Biological Diversity, *open for signature* June 5, 1992, S. TREATY DOC. NO. 103-20, 31 I.L.M. 818 (entered into force Dec. 29, 1993) [hereinafter Biodiversity Convention].

101. *Id.* art. 3 (reaffirming the sovereign right of nations to exploit their natural resources). *See* KISS & SHELTON, *supra* note 86, at 103.

102. The GEF is a multilateral fund, administered by the World Bank, to promote environmentally sustainable projects in the developing world. *See* Andrew S. Jones, *The Global Environment Facility's Failure to Promote Sustainable Forestry in Ecuador: The Case of Ecoforest 2000*, 14 VA. ENVTL. L. J. 507, 520–29 (1995) (discussing the GEF and the World Bank's role in administering the fund).

103. *See id.* at 535–42.

104. Biodiversity Convention, *supra* note 100, art. 7.

105. *Id.* art. 8(m).

106. *Id.* art. 8(a), (e).

107. *Id.* art. 7.

monitor "components of biological diversity important for its conservation and sustainable use"[108] and to establish reserves "where special measures need to be taken to conserve biological diversity."[109] Articles 23–27 create a potential enforcement and information dissemination scheme. A Convention Secretariat and Conference are created and the possibility of inter-nation disputes is recognized.[110] The Convention retains the focus on transnational harm as the basis for any state liability.[111] The next two sections explore the scientific and institutional problems that biodiversity protection presents.

D. The Science of Biodiversity Protection

Biodiversity protection requires the intense application of science to land use policies, but science cannot yet deliver the necessary information to make informed resource use choices. The problem is furthered by an important paradigm shift in ecology that is not fully reflected in the Biodiversity Convention. Biodiversity protection encompasses three levels of protection: (1) generic diversity, (2) species diversity, and (3) ecosystem or community diversity. The last two measures may have a large impact on domestic laws of land use and environmental regulation because the achievement of these objectives requires the development of new boundaries in real rather than ideal landscapes.

Biodiversity is not easy to measure on the ground because the core idea, species richness, is essentially a normative rather than a scientific construct. Biologists are developing measures of taxonomic richness but these must be applied on differing geographic scales. Biodiversity must be measured at the global, national, and regional level. Nonetheless, science is rapidly developing a set of measures for biodiversity on both small and large scales that can be used to provide information about the status of existing trends and to measure the progress of protection goals.[112] The basic measures are:

1. *Percentage of Species Richness.* This measure looks at factors such as taxonomic richness, primarily plants and vertebrates.
2. *Species at Risk.* This measure examines the absolute number as well as the percentage of species threatened with extinction or extirpation and the percentage of species at risk from habitat loss and other stresses. It also can include indexes of the range of risks faced by the target species. For example, "biodiversity hot spots" can be identified based on the percentage of endemic species in relation to the land area available to sustain them.
3. *Protection Ratios.* This measure seeks to inventory the effectiveness of existing land dedications for habitat protection of threatened and endemic species and other protection measures such as *in situ* conservation. This index effectively highlights problem regions such as Asia. The percentage of land in protected areas is low in the Pacific Rim, including Australia, compared to all other regions of the world.[113]
4. *Community Diversity Indicators.* This index includes estimates of the extent of area dominated by non-domesticated species and the patch size of these

108. *Id.* art. 7(a)–(b).
109. *Id.* art. 8(a).
110. The Article 27 dispute resolution procedure would presumably be triggered by a state that invokes the Article 3 mandate to insure "that activities within their jurisdiction or control do not cause damage to the environment or other States or of areas beyond the limits of national jurisdiction." *Id.* art. 3.
111. *Id.* art. 3.
112. This analysis is adapted from WALTER REID ET AL., BIODIVERSITY INDICATORS FOR POLICY-MAKERS (1993).
113. *See id.* at 19.

areas. It also includes the size of the area within protected designations dominated by non-domestic vegetation, agricultural crops, and livestock.

The science being developed to support biodiversity protection is more complicated than policy-makers originally assumed because of a paradigm shift in ecology that is just beginning to penetrate the legal consciousness. Environmental law and policy is founded on the equilibrium paradigm in ecology,[114] which promoted the idea that undisturbed nature was "in balance." By the 1980s, the equilibrium paradigm had been replaced with more hard-edged probabilistic theories of nonequilibrium ecosystem behavior. The more hard-edged theories reject the vision of the balance of nature as a religious construct and are examples of mechanistic enlightenment thinking. In a path-breaking book, Daniel Botkin has "deconstructed" the equilibrium paradigm as a misguided effort to match science to theological and scientific visions of a perfect universe.[115] His basic argument is that the images of nature that have influenced ecology are static when in fact the kinds of problems that we face require a dynamic view of nature—a view that starts from the premises that human action is one of the principal forces operating on ecosystems and that system disturbances are both predictable and random.

The nonequilibrium paradigm views ecosystems as patches or collections of conditions that exist for finite periods of time[116] and recognizes that the accelerating interaction between humans and the natural environment makes it impossible to return to an ideal state of nature.[117] As an eminent ecologist put it, the first and over-arching great idea of ecology is that "an ecosystem is a thermodynamically open, far from equilibrium, system."[118] These new models challenge the biodiversity preservation strategies adopted by the first generation of environmental laws. The creation of reserves is still a central protection strategy, but the basic idea that nature cannot be completely walled off from human contact to preserve a "balance" has been rejected by most ecologists and students of biodiversity conservation.[119] To be effective, biodiversity reserves must be integrated into the real landscape and intensively managed. Adherents to the nonequilibrium paradigm have pioneered a sophisticated new regulatory, applied science—conservation biology—to protect ecosystems from human insults.[120] Conservation biology seeks to understand relationships between species extinction and habitat fragmentation,[121] to develop models, and to identify and delineate the minimum amount of habitat reserves in specific areas that are necessary to maintain viable populations of protected species. As a consequence, resource management generally is shifting from preservation as the dominant biodiversity strategy to preservation as the integral component of ecosystem restoration and adaptive management. Management

114. I have traced this influence in A. Dan Tarlock, *The Nonequilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law*, 27 LOY. L.A. L. REV. 1121 (1994). *See also* Fred P. Bosselman & A. Dan Tarlock, *The Influence of Ecological Science on American Law: An Introduction*, 69 CHI.-KENT L. REV. 847 (1994).

115. *See* DANIEL B. BOTKIN, DISCORDANT HARMONIES: A NEW ECOLOGY FOR THE TWENTY-FIRST CENTURY (1990).

116. *See generally* Dean L. Urban et al., *Landscape Ecology*, 37 BIOSCIENCE 119 (1987).

117. *See generally* BILL MCKIBBEN, THE END OF NATURE (1989) (presenting the philosophical basis for the new ecology and arguing that the modern mind separates humanity from nature, making the romantic visions of harmony between humanity and nature impossible).

118. Eugene P. Odum, *Roundtable: Great Ideas for Ecology for the 1990s*, 42 BIOSCIENCE 542, 542 (1992).

119. STEPHEN BUDIANSKY, NATURE'S KEEPERS: THE NEW SCIENCE OF NATURE MANAGEMENT 132–33 (1995) (summarizing the reasons that "hands off" natural management is being rejected as a viable resource management policy).

120. The leading text is CONSERVATION BIOLOGY: AN EVOLUTIONARY-ECOLOGICAL PERSPECTIVE (Michael E. Soulé & Bruce A. Wilcox eds., 1980).

121. *See* REED F. NOSS & ALLEN Y. COOPERRIDER, SAVING NATURE'S LEGACY: PROTECTING AND RESTORING BIODIVERSITY 50–54 (1994).

will be a series of calculated risky experiments. "[N]ature moves and changes and involves risks and uncertainties and . . . our own judgments of our actions must be made against this moving target."[122]

The nonequilibrium paradigm and conservation biology have substantial implications for the integration of biodiversity conservation and sustainable development. The basic objective of conservation biology is to manage nature to mimic natural systems. As Professor Jonathan Wiener argues, "[w]e need to move from an environmental law based on a paradigm of a stable equilibrium—a policy mismatch in light of the new ecology—to an environmental law that welcomes change"[123] and recognizes that the dichotomy between natural and not natural is a human construct which leads to unacceptable results. Actions must be judged by their consequences, not their categories. We still need such reserves but we need to view them as long-term adaptive management experiments instead of "natural" areas isolated from the taint of human contamination. In the end, this will require "[a] more complex and embracing form of benefit-cost judgment, which includes consideration of qualitative factors, ecological risks and values, and uncertainties . . . ."[124] Although until very recently the world conservation community remained focused on the creation of secure reserves, earlier declarations can be adapted to these objectives. For example, the World Charter for Nature states that degraded areas "shall be rehabilitated for purposes in accord with their natural potential and compatible with the well-being of affected populations."[125]

E. The Institutional Barriers

The implementation of biodiversity protection is difficult because the fundamental idea is a radical shift in our perception of landscapes. We have historically viewed them as resources which acquire value only when exploited, but we now see them as bioregions which possess values both as "natural" spaces, sacred and otherwise, as well as for commodity production.[126] This shift requires a fundamental reassessment of most national land-use polices and legal techniques developed to implement them. Specifically, biodiversity protection cuts against four universal and deeply held land-use management assumptions and widely accepted legal principles.

First, biodiversity protection challenges the idea that land-use policy should be based on the division of land into different single or dominant use categories. In general, land-use law, broadly defined, dedicates all lands within a country to single or dominant use to optimize its value. The above is the theory behind both unlimited exploitation and reserve creation and is followed for both public[127] and private lands. The net result is the creation of entitlements to exploit with minimal attention to the social costs of exploitation.[128] Brazil's 1965 Federal Forest Code is an example of single use legislation which greatly contributed

122. BOTKIN, *supra* note 115, at 190.

123. Jonathan Baert Wiener, *Law and the New Ecology: Evolution, Catagories, and Consequences*, 22 ECOLOGY L.Q. 325, 334 (1995) (reviewing JONATHAN WEINER, THE BEAK OF THE FINCH: A STORY OF EVOLUTION IN OUR TIME (1994)).

124. *Id.* at 356.

125. World Charter for Nature, G.A. Res. 37/7, U.N. GAOR, 37th Sess. Supp. No. 51, at 17, U.N. Doc A/37/51 (1982).

126. In many parts of the world, such as Australia, this perception shift is recent and dramatic. *See* THE HUMANITIES AND THE AUSTRALIAN ENVIRONMENT (D.J. Mulvaney ed., 1991).

127. The recent unsuccessful challenges to the authority of federal land management agencies to promote biodiversity of federal lands illustrate the persistence of the idea that land is dedicated to commodity production and nothing else. *See* Seattle Audubon Soc. v. Lyons, 871 F. Supp. 1291 (W.D. Wash. 1994).

128. *See, e.g.*, Ley de Tierras Baldias y Colonización [Unoccupied Lands and Colonization Law], Decreto Supremo, No. 1480 de 23 de julio de 1964, R.O. No. 297, arts. 100–03 (Ecuador), which can be interpreted to grant private rights to parties who entered and cleared 50% of forested land.

to rainforest destruction. The Code required the preparation of management plans but allowed up to fifty percent of every tract to be harvested,[129] and the result was that fifty percent became the maximum coverage left standing.[130]

Second, biodiversity protection challenges many conventional notions of urban and rural and "open" and "closed" boundary delineation. The problem of land conversion from less to more intensive uses is an age-old and continuing one.[131] Historically, land conversion was not a problem but a sign of progress, and the objective of planning has been to preserve remnants of nature. Until the nineteenth century, human intervention in nature was assumed to be good, but gradually we have shifted to the opposite assumption. Modern environmental law rests on the assumption that humans should not contaminate nature,[132] although "trying to sanitize nature . . . does not necessarily make life safer or healthier."[133] The British idea of urban greenbelts to cabin development into compact areas was carried over to biodiversity protection. Reserve creation remains the prime protection strategy. The Biodiversity Convention mandates the creation of an undetermined amount of reserve area in each country, and the new science of conservation biology seeks to develop reserves that preserve the minimum amount of habitat necessary for species survival. As a result, the European-inspired effort to maintain sharp distinctions between urban and "green" spaces is being replaced with management schemes that recognize the interaction between human and natural uses.[134]

Modern theories of biodiversity protection seek to go beyond merely preserving and "fencing off" large areas from development because the strategy is often not a *sufficient* biodiversity protection strategy and is not consistent with the norm of sustainable development. For example, walling off areas to local communities may actually increase undesirable environmental activity, such as poaching, and disrupt more environmentally sensitive community control.[135] Modern rainforest conservation programs often mix farms and forests to promote economically viable local communities with a stake in regional forest management strategies that include biodiversity reserves.[136] Modern strategies also place equal emphasis on the rehabilitation of degraded ecosystems. The constitutions of most Brazilian Amazon Basin states impose various general restoration duties on the state or those who exploit timber or minerals.[137]

The evolution of Brazil's reserve policy illustrates the shift from separatist to integrationist conservation thinking. In the midst of its ambitious development plans pushed by the military governments, Brazil had to respond to the intense post-Stockholm criticism of the nineteenth century actions of the United States and other less developed countries. Brazil began to develop a nature preserve and a national park program in 1974, and

129. CODIGO FLORESTAL [C. FLOR.] [Forestry Code], Lei No. 4.771, art. 44, de 15 de setembro de 1965, D.O.U. de 28.09.65 (Braz.), *reprinted in* 5 COLEÇÃO DAS LEIS 157 (1965).

130. *See* Roberto dos Santos Vieira, *Brazilian Environmental Law Relating to Amazonia*, *in* AMAZONIA AND SIBERIA, *supra* note 21, at 105, 119.

131. *See* A. Dan Tarlock, *City Versus Country Side: Environmental Equity in Context*, 21 FORDHAM URB. L.J. 461, 470 (1994).

132. *See* Wiener, *supra* note 123, at 344.

133. *Id.* at 346.

134. *See, e.g.*, Gordon A. Bradley & B. Bruce Bare, *Issues and Opportunities on the Urban Forest Interface*, *in* CULTURE, CONFLICT, AND COMMUNICATION IN THE WILDLAND-URBAN INTERFACE 17 (Alan W. Ewert et al. eds., 1993).

135. For a theoretical defense of this proposition and many examples, see ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (1991).

136. For Costa Rican and Mexican case studies of the application of this principle, see MICHAEL WELLS & KATRINA BRANDON, PEOPLE AND PARKS: LINKING PROTECTED AREA MANAGEMENT WITH LOCAL COMMUNITIES 88–94 (1992).

137. *See* Paulo Leme Machado, *Comparative Law and Environmental Law Relating to the Brazilian Amazon*, *in* AMAZONIA AND SIBERIA, *supra* note 21, at 130, 139–40.

extensive large reserves (in and out of the Amazon region) were created at least on paper. The emphasis was on the creation of reserves unconnected to indigenous populations, who were perceived as a threat to the Amazon's biodiversity.[138] Conservationists at the Institute for Forest Development made a "tactical decision to emphasize protected natural areas at the expense of broader conservation measures,"[139] and this decision contributed, along with many other problems, to the failure of Brazil's first serious Amazon protection programs. Resources never matched needs, and thus the ecological stations and protected areas were "outsized for the resources available for their defense, which made them passive entities whose fortunes could be modified only slightly by their managers."[140]

With the end of military rule, Brazil began a second generation of rainforest protection programs. The formal Amazon development subsidies and incentives were repealed, but the economic and cultural dynamics of the country have not changed. Therefore, the success of the new initiatives is very much in doubt. Between 1987 and 1990, and after intense pressure from the forest dwellers, extractive reserves were established in Brazil with the help of the World Bank[141] and other international conservation organizations.[142] Extraction, or "collecting," as it was known, has a long and cautionary history in Brazil. Sasparilla "collecting" was introduced in the eighteenth century, but collection practices destroy the trees in the process of digging up the valuable roots.[143] The push for sustainable development has revived interest in small-scale traditional resource management and in efforts to integrate and harmonize local and central resource management.[144]

Brazil's General Extractive Reserves Decree defines reserves as "territorial spaces allocated to sustainable exploitation and to conservation of renewable natural resources by the extractive community."[145] These areas are exclusively dedicated to the cultivation and harvest of nontimber forest crops. The long-term success of the reserves depends on the establishment of a collective property entitlement in those who depend on the reserve, but this will be difficult because there are many individual and conflicting groups claiming these areas. The property rights regimes for the reserves are both innovative and complex given the long history of Brazil's encouragement of settlement and farming in the interior. Brazil recognizes retained public lands (which stem from original Crown ownership), private lands, and vacant or returned lands, which, like the U.S. public domain, were open to occupation but never legally passed into private ownership.[146]

Reserve policy relies on collective property rights.[147] Extraction will be based on community rather than individual rights. Under the Rights of Use Decree, the Brazilian

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138. The full and depressing story of Brazil's efforts to create reserves and parks from 1974 to 1989 is told in RONALD A. FORESTRA, AMAZON CONSERVATION IN THE AGE OF DEVELOPMENT (1991). The initial hostility toward the inclusion of Indians is discussed at pp. 63–68.

139. *Id.* at 185.

140. *Id.* at 237.

141. *See Environmental Events in Latin America, 1995*, *supra* note 45, at 385.

142. *See* ENVIRONMENTAL LAW INSTITUTE, BRAZIL'S EXTRACTIVE RESERVES: FUNDAMENTAL ASPECTS OF THEIR IMPLEMENTATION 1–16 (1990) [hereinafter BRAZIL'S EXTRACTIVE RESERVES].

143. *See* HEMMING, *supra* note 14, at 44.

144. Professor Elinor Ostrum of Indiana University, Bloomington has been a leader in this effort. *E.g.*, *Designing Complexity to Govern Complexity*, *in* PROPERTY RIGHTS AND ENVIRONMENT: SOCIAL AND ECOLOGICAL ISSUES 33 (Susan Hanna & Mohan Munasinghe eds., 1995); GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION, *supra* note 135.

145. Decreto No. 98.897, de 30 de janeiro de 1990, D.O.U. de 31.01.1990 (Braz.), *reprinted in*, 1 COLEÇÃO DAS LEIS 392 (1990). For a full discussion of the legal basis for the decree, see BRAZIL'S EXTRACTIVE RESERVES, *supra* note at 142, at 17–34.

146. *See id.* at 79–84.

147. There is a long tradition of identifying the recognition of exclusive individual rights with the efficient management of natural resources. *See, e.g.*, Robert C. Ellickson, *Property in Land*, 102 YALE L.J. 1315 (1993). However, there is a renewed interest in the relationship between common property regimes and sustainable

federal government can execute a concession contract to traditional community groups that grants the beneficiary an exclusive sixty year usufructuary right to exploit the reserve. Exploitation must be done in a sustainable manner and important biodiversity resources must be preserved. All property within the reserves will be public, either federal or state. A reserve's success depends on whether it can become a self-supporting, independent area or whether it will continue to be or become just another new resettlement area.[148] From a land management standpoint, the different land uses contemplated require intense levels of management, control, and beneficiary education which may be beyond the capability of most host countries. The initial results from Brazil are mixed at best. For example, residents of the Chico Mendes Reserve in Acre have migrated to cities because life is too hard in the reserve.[149]

The third problem raised by biodiversity protection is that it disturbs political and legal expectations of easy and rapid land conversion. Law encourages conversion in many ways. The Brazilian Land Law[150] allowed new settlers to gain tenure by occupying and cultivating land in the Amazon. "In practice, effective residence and personal harvesting of the land came to mean that tenants should remove the forest cover, in order to show that actual use was being practised."[151] Conversion has also been encouraged by international lending practices, although the environmental impact of international lending is difficult to measure. There is, for example, no simple causal relationship between foreign debt obligations and timber exploitation.[152] In the late twentieth century, as the idea of progress has waned and a nostalgia for rural society has increased, most countries of the world have tried to moderate conversion by reserving a few areas from conversion. Rainforest protection requires a fundamental shift away from conversion to sustainable use practices that do not destroy the fundamental forest ecosystem. The creation of the Ciracio reserve in the state of Maranhão is credited with stopping palm tree cutting by adjoining farmers and thus preserving a valuable source of palm oil.

The biggest problem raised by the expectation that vacant land is "wasteland" waiting to be converted is the recognition of vested property rights. In almost all countries these expectations are protected by the constitutional guarantee that property will not be expropriated without compensation.[153] The U.S. Supreme Court has recently pronounced that land is the highest form of private property,[154] and that decision's influence will be felt world-wide. In every legal system, not every claim will be recognized as a vested property right entitled to constitutional or statutory protection. Brazil has a process to verify land titles based on occupation and to cut off private claims to unoccupied public land. However, if a private claimant has perfected title, the land must be condemned. The legal authority exists to condemn private property for social interest purposes, but the

development. *See* Hoyt, *supra* note 81, at 212–16. *See also* Carol Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. CHI. L. REV. 711, 122–23 (1986) (suggesting that properties devoted to noncommercial uses may be most valuable when they are accessible to the public at large).

148. *See* Roth, *supra* note 21, at 255.

149. *See* BRAZIL'S EXTRACTIVE RESERVES, *supra* note 142, at 41–47.

150. Lei No. 4.504, de 30 de novembro de 1964, D.O.U. de 17.12.1964 (Braz.), *reprinted* in, 7 COLEÇÃO DAS LEIS 314 (1964).

151. Vieira, *supra* note 130, at 118.

152. *See* FRANCES CAIRNCROSS, A GUIDE TO BUSINESS AND THE ENVIRONMENT 248 (1995) (reporting that World Bank pressure on the Philippines to restructure its economy resulted in decreased timber production but increased rural migration to hilly regions with marginal agricultural and environmentally fragile lands).

153. *See, e.g.*, CONSTITUIÇÃO FEDERAL art. 5, cl. 24 (Braz.).

154. *See* Lucas v. South Carolina Coastal Council, 112 S. Ct. 2886 (1992).

financial constraints may be too great. "Forest cover" indemnifications have been granted by the courts, which could include the value of each tree on the tract.[155]

The fourth problem is the tension between affirmative obligations and negative prohibitions. Ultimately, the affirmative-negative distinction does not wash because there are no clear standards to make distinct classifications. However, we identify legitimate government action with negative prohibitions. For example, land-use law follows this distinction in defining the line between regulation that requires compensation and regulation that does not. In all legal systems the basis of land-use regulation is the prohibition of activities which injure neighboring lands. Biodiversity protection and sustainable development do not fit with the nuisance or abuse of rights paradigm. Instead, it often requires land owners to undertake extensive affirmative obligations to serve the public interest, and this idea conflicts with John Stuart Mills's argument that government intervention should be limited to the prevention of harm.

IV. THE IMPACT OF SUSTAINABLE DEVELOPMENT ON LEGAL RULES

Sustainable development can serve as a basis to reevaluate and change a number of domestic and international laws that encourage rainforest destruction and other unsustainable resource use practices. The concept is not a magic wand that transforms anticonservation rules into proconservation rules. Sustainable development can, however, provide a rationale for eliminating some deeply entrenched *per se* legal rules that discourage rainforest conservation. This proposition is controversial because the elimination of *per se* conservation barriers represents a substantial power shift to host countries or, conversely, an encroachment of host country prerogatives. Still, the elimination of *per se* barriers will shift the legal focus from an abstract inquiry into the merits of the barrier to the appropriate limitations on the use of these new entitlements or restraints and on the responsibilities of host countries.

A. A New Intellectual Property Regime

Sustainable development can help provide justifications for new intellectual property rights regimes that curb the traditional policy of cheap access to rainforest bioriches.[156] The creation of property rights regimes that allow host countries to capture more of the value of rainforests is central to the long-term success of the project of rainforest conservation. Historically, only those who seek to exploit nature in developing new and useful products receive property protection. At the present time, the prevailing rule is that no one owns "biodiversity" until a crop is harvested or a plant, animal, or derivative product is manipulated by a human effort to create something new and useful. The Biodiversity Convention supports sustainable development by an important and extremely controversial change in intellectual property law. However, intellectual property law does not protect "products of nature." This rule prohibits either the host country or the exploiter from claiming a patent in a useful element of biodiversity simply by discovering a useful plant or

155. BRAZIL'S EXTRACTIVE RESERVES, *supra* note 142, at 93. In addition, if the government fails to dedicate the property to the purpose for which it was condemned, the previous property owner "may either request that title to the property revert or may sue for any losses suffered as a result of the condemnation." *Id.* at 92.

156. *See generally* INTELLECTUAL PROPERTY RIGHTS AND BIODIVERSITY CONSERVATION: AN INTERDISCIPLINARY ANALYSIS OF THE VALUE OF MEDICINAL PLANTS 19–126 (Timothy Swanson ed., 1995) [hereinafter INTELLECTUAL PROPERTY RIGHTS] (giving a good introduction to the scientific basis of the potential values of rainforest biodiversity).

natural process and marketing it.[157] The Convention reverses this order and seeks to reward "those who exercise forbearance and thus *preserve* biodiversity."[158] Articles 16 and 17 create sovereign rights in biodiversity that the host nation may exploit by permitting prospecting and capturing a percentage of the royalties from any valuable discoveries.[159] The Convention supports both new patent and concession model regimes.[160]

Concession models are the easiest to implement. Biodiversity can be developed on the mineral concession model or the recognition of "compensation-style rights." A "country which sourced a particular type of genetic material would have a 'right' to a royalty-style payment from the organization that had developed into and marketed the end-product."[161] Countries have long claimed ownership of their mineral resources and licensed prospecting and exploitation concessions to foreign oil companies. This practice can be adapted to biodiversity prospecting.[162] Costa Rica pioneered this idea with the joint venture between Merck Pharmaceutical Company and the nonprofit Costa Rican National Institute for Biodiversity. Merck funded an assessment of Costa Rica's biodiversity resources in return for the chance to evaluate the inventory and use the information. Merck will pay royalties on any commercial products derived from the inventory.[163] The concession idea is promising, but there are two limitations. First, a country's perceived genic resource reserves may not create sufficient incentives for companies to obtain prospecting permits. Second, it will be extremely difficult to create exclusive property rights in biodiversity information,[164] and thus the incentives to seek concessions will again be weak.

Sustainable development equally supports the creation of new patent rights in *unmodified* nature which may be claimed and licensed by host countries. The United States and Europe have rejected structural patents on chemical compounds in the absence of a demonstrated use for the compound;[165] but, "[d]espite its inequity as a system for compensating human efforts, something resembling a structure patent is exactly the sort of protection needed for biodiversity chemical structures."[166] At the present time, the need for human manipulation bars the recognition of patent rights for discoveries of nature, but the distinction between natural and artificial gene sequences is eroding in patent law as the biotechnology industry progresses. Thus, there will be future pressure to eliminate this

157. The leading case is Funk Brothers Seed Co. v. Kalo Inoculant Co., 233 U.S. 127 (1948). *See also*, United States v. Chakrabarty, 447 U.S. 303, 309 (1980) (holding that patent protection is available to purified and altered products). *See generally* IVER P. COOPER, BIOTECHNOLOGY AND THE LAW, ch. 3 (1982).

158. Daniel T. Jenks, *The Convention on Biological Diversity—An Efficient Framework for the Preservation of Life on Earth?*, 15 NW. J. INT'L L. & BUS. 636, 641 (1995).

159. The Convention creates a new form of protected intellectual property. The United States and the patent law of most countries follow the "product of nature" doctrine which denies patent protection to unmodified "natural" process. *See* Shayana Kadidal, *Plants, Property and Pharmaceutical Products*, 103 YALE L. J. 223, 238 (1993).

160. See Klaus Bosselmann, *Plants and Politics: The International Legal Regime Concerning Biotechnology and Biodiversity*, 7 COLO. J. INT'L ENVTL. L. & POL'Y 111 (1996) for a useful analysis of the problems that will arise in the implementation of the Convention.

161. Ian Walden, *Preserving Biodiversity: The Rule of Property Rights*, *in* INTELLECTUAL PROPERTY RIGHTS, *supra* note 156, at 176, 179.

162. *See generally* Michael A. Gollin, *Biodiversity: Preventing an Ill-begotten Harvest & Ownership Strategies for Conserving Biological Diversity*, 10 ADELPHIA L.J. 45 (1994).

163. *See* Kristen Peterson, *Recent Property Trends in Development*, 33 HARV. INT'L. L. J. 277, 288 (1992). For an analysis of the possible terms of a concession see Steven M. Rubin, *Biodiversity Prospecting: Using Innovative Contractual Provisions to Foster Ethnobotanical Knowledge, Technology and Conservation*, 5 COLO. J. INT'L ENVTL. L. & POL'Y 23, 36–54 (1994).

164. *See* Christopher D. Stone, *What to do About Biodiversity: Property Rights, Public Goods, and the Earth's Biological Riches*, 68 S. CAL. L. REV. 577, 605–09 (1994).

165. *See, e.g.*, Brenner v. Manson, 383 U.S. 519 (1966).

166. Kadidal, *supra* note 159, at 254 (citation omitted).

barrier[167] and to create an intellectual property regime that recognizes that host countries may claim a "sui generis 'intellectual property-style' right in unmodified genetic sequences . . . ."[168]

B. Sustainable Trade Barriers

Developed countries could influence the adoption of sustainable rainforest use by imposing import restrictions on unsustainably produced timber products. In practice, this policy option will be of limited utility because timber harvesting for exports is a small part of the destruction problem, and effective protection initiatives will be the ones taken domestically with international aid. However, it is a possible option which should not be foreclosed as it is under current interpretations of GATT.[169] There are several precedents for sustainable export and import bans. Export bans are an easy case since the WTO regime does not (as does the U.S. Constitution's Commerce Clause),[170] require a country to forego the conservation of its scarce resources to share them with other countries. Export bans have been invoked by Latin American countries. To try to stop illegal timber exports to Brazil, Paraguay banned all timber exports in 1994.[171]

Sustainable import bans are much more controversial. The prevailing assumption is that these import bans are illegal under the WTO.[172] This assumption is reflected in the 1994 Convention on the International Trade in Endangered Species (CITES) refusal to list Latin American mahogany as an Appendix II listed species.[173] The leading export precedent is Austria's abortive attempt to deter unsustainable hardwood timber harvest practices. Austria passed two pieces of legislation that sought to restrict tropical timber. The first imposed an "eco-tax" on all products made from tropical wood to be used for international sustainable harvesting projects and an eco-labeling which distinguished between products made from tropical timber harvested by sustainable practices and those not.[174] However, Austria withdrew the tax after Malaysia lodged a complaint with the GATT (now WTO) Committee on Technical Barriers to Trade, which would have likely been sustained. Similarly, in 1994, Holland replaced a 1991 import ban on nonsustainably harvested tropical timber with a North-South dialogue on sustainable development.[175]

The two nonbinding Tuna Dolphin panel decisions hold that unilateral process import bans are illegal under GATT.[176] All import restrictions are presumed to be illegal trade discrimination under Article III unless they fall within the public health and conservation

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167. After a survey of United States and British patent and genetic property law, Ian Walden concludes that "[a] successful patent [for a natural genetic sequence] would be possible depending on the extent to which subsequent development work is carried out . . . ; the nature of the claim and the position of the [genetic] sequence within that claim . . . " provided that the requirements of novelty, obviousness, and application were also met. Walden, *supra* note 161, at 187.

168. This could require an international regime to resolve conflicting host country entitlements and to insure that fair and adequate incentives to prospect and market are maintained. *See id.*

169. *See* Thomas J. Schoenbaum, *Free International Trade and Protection of the Environment: Irreconcilable Conflict?*, 86 AM. J. INT'L L. 700, 721–23 (1992).

170. *See* Sporhase v. Nebraska (*ex rel.* Douglas), 458 U.S. 941, 953–54 (1982).

171. *See Environmental Events in Latin America, 1995*, *supra* note 45, at 385.

172. *See* Brian F. Chase, *Tropical Forests and Trade Policy: The Legality of Unilateral Attempts to Promote Sustainable Development Under Gatt*, 17 HASTINGS INT'L & COMP. L. REV. 349, 383 (1994).

173. *See Environmental Events in Latin America, 1995*, *supra* note 45, at 386.

174. *See* Chase, *supra* note 91, at 376–77. *See also Environmental Events in Latin America, 1995*, *supra* note 45, at 386.

175. *See* Ans Kolk, *The Limited Returns of Dutch Rainforest Policy*, 8 INT'L ENVTL. AFF. 41, 47 (1996).

176. *See* Tuna Dolphin, *supra* note 72, at 1618. *See also* Jeffrey L. Dunoff, *Reconciling International Trade with Preservation of the Global Commons: Can We Protect and Prosper?*, 49 WASH. & LEE L. REV. 1407, 1415 (1992).

exceptions of Article XX. The Tuna-Dolphin Panel held that the U.S. import ban was outside the scope of Article XX exceptions because it was a process standard, and the ban applied to activities outside the territory of the United States. This interpretation is a cramped reading of Article XX in light of the expansion of domestic and international global commons protection regimes. The narrow trade discrimination focus ignores the need to protect the sustainability of shared resources. Both bribes and direct restraints are legitimate means to this end.[177] The legitimate concerns that nations will use environmental standards such as process standards as disguised trade barriers can be addressed within GATT tests that distinguish between "methods which form the economic or social backdrop to production, such as social security . . . and . . . methods which are intrinsically bound up with the collection, processing or production methods . . . ."[178]

C. *Debt-for-Nature*

Sustainable development supports new biodiversity conservation concepts such as debt-for-nature swaps. These swaps are attempts to create financial incentives for rainforest nations to preserve biodiversity. The basic rationale is simple. Rainforest nations are burdened with debt that was incurred to buy oil or finance inefficient public infrastructure in the 1970s. In 1987, a Washington, D.C.-based NGO purchased $650,000 worth of Bolivian debt for $100,000 in return for a government commitment to preserve 3.7 million acres of tropical rainforest.[179] The experiment was not an initial success because the government failed to fund the management account for two years and did not enact the promised reserve protection legislation.[180] The enforcement problem was partially cured by the next swap. Ecuador issued $10,000,000 worth of bonds. NGOs were invited to purchase debt on the secondary market and then repay the bonds. The interest was assigned to Fundacion Natura for the purchase and management of reserves, and $10,000,000 of discounted debt was purchased. Debt-for-nature swaps involve foreign government debt purchases, debt forgiveness, or government grants to NGOs.

Debt-for-nature swaps are usually hailed as creative market solutions to biodiversity protection that result in a voluntary surrender of a country's sovereign right to develop. Some host countries are happy to turn unexploited natural areas into a source of needed cash, but to some countries, debt-for-nature swaps represent an unacceptable forced sale of the country's patrimony. Brazil has a long history of resistance to debt-for-nature swaps because they interfere with sovereignty.[181] This objection can be mitigated by the principle of sustainable development. The acceptance of the concept by most nations of the world represents a partial surrender of sovereignty, despite all the affirmations of national sovereignty in the Rio declarations, because they subject themselves to a standard of

177. For an extended defense of this position see Howard F. Chang, *An Economic Analysis of Trade Measures to Protect the Global Environment*, 83 GEO L.J. 2131 (1995).

178. Ilona Cheyne, *Environmental Unilateralism and the WTO/GATT System*, 24 GA. J. INT'L & COMP. L., 433, 445 (1995). For a good analysis of the similarities and differences between the dormant commerce clause of the United States Constitution and the Article III antidiscrimination standards of GATT, see Daniel A. Farber & Robert E. Hudec, *Free Trade and the Regulatory State: A GATT's-Eye View of the Dormant Commerce Clause*, 47 VAND. L. REV. 1041 (1994).

179. *See* J. Eugene Gibson & Randall K. Curtis, *A Debt-for-Nature Blueprint*, 28 COLUM. J. TRANSNAT'L L. 331, 354–55 (1990).

180. *See* Michael S. Sher, *Can Lawyers Save the Rainforest? Enforcing the Second Generation of Debt for Nature Swaps*, 17 HARV. ENVTL. L. REV. 151, 159 (1993).

181. "[P]rominent member of the Brazilian Congress, environmentalist Fabio Feldmann, stated that because of the sovereignty issue, [developing country] governments will not accept debt-for-nature arrangements." Priya Alagiri, *Give Us Sovereignty or Give Us Debt: Debtor Countries' Perspective on Debt-for-Nature Swaps*, 41 AM. U. L. REV. 485, 502–03 (1991).

conduct in return for the promise of assistance and toleration of differential development practices. Since debt-for-nature swaps can further sustainable development, they fall within the limitations of the North-South bargain.

V. CONCLUSION: TOWARD AN ETHIC OF STEWARDSHIP SOVEREIGNTY

The ethic of sustainable development can be implemented in international environmental law by modifying the concept of exclusive territorial sovereignty to make clear that nations have primary but not exclusive control over resource decisions with extraterritorial impacts and that nations owe duties to the international community. Scientific environmentalism counsels that the manner in which sovereignty is exercised is equally as important as the abstract legal principle. Thus, the most logical expression of the duty of sustainable development is the idea of stewardship sovereignty. Stewardship sovereignty builds upon two jurisprudential traditions within international law: Grotian idealism and the formulation of the idea of an international social contract. It joins them with environmental imperatives to supply a unifying perspective. If norms of international behavior are to develop, the dead-end principle of an international social contract based on the actual consent of all nation-states must be replaced with one based on what Professor Fernando Tesón, following Rawls, has called "rational hypothetical consent."[182]

The idea of limited rather than absolute sovereignty is now widely accepted by developed and developing nations. The *Tasmanian Dam Case* (where the Australian High Court accepted the World Heritage Convention as a restraint on its internal resource use)[183] and the constitutional protection of rainforests in the 1988 Brazil Constitution are both examples of the acceptance of stewardship obligations by rainforest countries. Stewardship sovereignty applies a basic principle of post-modern environmental ethics to international law. There is currently a lively debate about the source and scope of environmental ethics, but, at a minimum, there is also an emerging global consensus that we must replace the Greco-Judeo-Christian tradition that man is a despot over nature[184] with the principle that we are stewards of the earth.[185] Thus, we must approach all exploitation decisions with much more caution than we have in the past.

Stewardship is an evolving concept, but it contains three core consensus-building principles. The first is the principle of intergenerational equity articulated by Professor Edith Brown Weiss.[186] This standard permits resource exploitation subject to the constraint that we leave the resource in no worse shape than when we started. As a leading environmental philosopher has noted, "environmentalists will achieve more by appealing to the relatively noncontroversial and intuitive idea that the use of natural resources implies an obligation to protect them for future users—a sustainability theory based on intergenerational equity—rather than exotic appeals to hereto unnoticed inherent values in

182. Fernando R. Tesón, *International Obligation and the Theory of Hypothetical Consent,* 15 YALE J. INT'L. L. 84, 109 (1990). Tesón argues that "[i]f actual consent cannot lay the foundation for international obligation, perhaps we should give special foundational status not to *any* consent, but only to *rational* consent." *Id.* Professor Tesón has elaborated his critique of traditional international law which divorces the issue of state legitimacy from normative principles in Fernando R. Tesón, *The Kantian Theory of International Law,* 92 COLUM. L. REV. 53 (1992).

183. *See* Commonwealth v. Tasmania (1983) 158 C.L.R. 1 (Austrl.).

184. JOHN PASSMORE, MAN'S RESPONSIBILITY FOR NATURE (1974) remains the leading exponent of this position.

185. *See* ROBIN ATTFIELD, THE ETHICS OF ENVIRONMENTAL CONCERN (2d ed. 1991) (providing forceful exposition of this provocative thesis); *see also* sources cited notes 73–75 *supra.*

186. *See* WEISS, IN FAIRNESS TO FUTURE GENERATIONS, *supra* note 18, at 21.

nature."[187] The second principle is that sustainable rather than unrestrained development must be the norm of the future and follows from intergenerational equity. The final core idea—the precautionary principle—reinforces the first two because all development decisions, especially those in shared commons, must be made with an eye toward preserving options for future generations. In short, sustainable development is enlightened, forward-looking resource stewardship.

187. Bryan G. Norton, *Why I Am Not a Nonanthropocentrist: Callicott and the Failure of Monistic Inherentism*, 17 ENVTL. ETHICS 341, 356 (1995).