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Think Globally, (En)Act Locally: Promoting Effective National Environmental Regulatory Infrastructures in Developing Nations

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NOTE

Think Globally, (En)Act Locally: Promoting Effective National Environmental Regulatory Infrastructures in Developing Nations

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Introduction

Developing nations[1] are constructing infrastructure[2] on a massive scale.[3] Infrastructure provides the framework necessary for a nation's economic growth[4] and consists primarily of public utilities,[5] public works,[6] and transportation.[7] More specifically, infrastructure is comprised of facilities

1. Throughout this note, the terms "developing" and "developed" nations will be used to reflect the distinction between those nations that, respectively, tend to receive and tend to provide foreign assistance and foreign direct investment funds.

2. *See* THE WORLD BANK, WORLD DEVELOPMENT REPORT 1994 – INFRASTRUCTURE FOR DEVELOPMENT 1 (1994) [hereinafter WORLD DEVELOPMENT REPORT 1994].

3. *See* THE WORLD BANK, 1993 WORLD BANK INFRASTRUCTURE SYMPOSIUM 11 (1993) [hereinafter SYMPOSIUM]; DIV. ON TRANSNAT'L CORPS. AND INVESTMENT, THE WORLD BANK, WORLD INVESTMENT REPORT 60 (1994) [hereinafter WORLD INVESTMENT REPORT] ("South, East, and South-East Asia alone will need more than $1 trillion to finance infrastructure and industrial projects over the next decade."). It has been estimated that at least two trillion dollars over the course of the next decade will be required to meet the demand for infrastructure in the developing nations of the world. WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 95.

4. Infrastructure is "if not the engine, then the 'wheels' of economic growth." WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 14. Infrastructure is essential to the prosperity of households and the productivity of businesses. *Id.* at 13. There is a strong correlation between the quantity and quality of a nation's infrastructure, and both that nation's per capita Gross Domestic Product and its household income levels. *Id.* at 14, 16.

5. This category includes: power plants, gas and oil pipelines, telecommunications, water supply, sanitation and sewerage, solid waste collection and disposal. WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 13.

6. This category includes: major dams and canals for irrigation, and roads and highways. *Id.*

7. This category includes: railways, urban transport systems such as subways and tramways, ports, waterways and airports. *Id.*

for transportation, power generation, water provision, sanitation (including wastewater treatment), telecommunications, and irrigation. Currently, private foreign direct investment[8] funds industrial development in developing nations at an unprecedented rate.[9] In order to attract foreign capital for production and manufacturing projects as well as to retain domestic capital that might otherwise take "flight" to more developed economies and more secure investments, a developing nation must have a well-developed infrastructure.[10] Further, developing nations are increasingly competing with each other for scarce foreign investment funds. Foreign and domestic investors will consider the condition of and prospects for a potential investee's infrastructure as a major criterion in making investment decisions.[11] Consequently, developing nations have great incentives to construct as much infrastructure as possible, as quickly as possible.

Rapid development of infrastructure has brought many developing nations both rapid economic growth[12] and massive environmental degradation.[13] The latter[14] occurs in large part because developing nations gen-

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8. The International Monetary Fund defines foreign direct investment as:
> [an] investment that reflects the objective of obtaining a lasting interest by a resident entity in one economy in an enterprise resident in another economy . . . . The lasting interest implies the existence of a long-term relationship between the direct investor and the [invested-in] enterprise and a significant degree of influence by the investor on the management of the enterprise.

CHANDER KANT, FOREIGN DIRECT INVESTMENT AND CAPITAL FLIGHT 3 (1996).

9. Foreign direct investment flows into developing nations are at their highest levels ever. *See* WORLD INVESTMENT REPORT, *supra* note 3, at 40.

10. KANT, *supra* note 8, at 3.

11. *See id.*; FOREIGN DIRECT INVESTMENT IN THE SEACEN COUNTRIES vii (Azizah Talib ed., 1994); WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 28 ("Intensified efforts by some developing countries . . . to improve their domestic infrastructure (especially transportation and communications), including improvements secured through privatization involving foreign direct investment, will play a role in maintaining the level and growth of investment flows."). "Adequate quantity and reliability of infrastructure are key factors in the ability of countries to compete in international trade . . . ." *Id.* at 17.

12. While the Gross National Product (GNP) of the United States has grown only 1.7 percent annually for the period 1980-1992, the GNP of many developing nations has far outstripped that figure. For example, during the same period, Singapore's GNP grew 5.3 percent, Chile's 3.5 percent, Thailand's 6.0 percent, China's 7.6 percent, and the Republic of Korea's 8.5 percent. WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 162.

13. *See* WORLD DEVELOPMENT REPORT 1992: DEVELOPMENT AND THE ENVIRONMENT 1-3, 7, 9 (1992) [hereinafter WORLD DEVELOPMENT REPORT 1992]; ENVIRONMENT DEPARTMENT, WORLD BANK, 1 ENVIRONMENTAL ASSESSMENT SOURCEBOOK viii (1991) [hereinafter ENVIRONMENTAL ASSESSMENT SOURCEBOOK] (Constructing new infrastructure has "major potential for negative environmental impact."); WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 87 ("As the scale of infrastructure projects grows, environmental consequences become increasingly significant."); Daniel C.K. Chow, *Recognizing the Advantages of Taiwan's Direct Participation in International Environmental Law Treaties*, 14 STAN. ENVTL. L. J. 256, 257 (1995) ("Long one of the world's most densely populated areas [Taiwan] now confronts catastrophic public health and pollution problems caused by explosive industrial growth that has occurred almost completely unchecked by environmental controls.").

Whole developing regions suffer increasing environmental degradation raised by their rapid economic development. *See* JEFFREY S. HAMMER & SUDHIR SHETTY, EAST ASIA'S ENVIRONMENT: PRINCIPLES AND PRIORITIES FOR ACTION 4 (1995) (stating that, "[i]f unchecked, the pace of environmental damage from pollution and over extraction of renewable

erally fail to mitigate sufficiently, by regulation or otherwise, the effects of infrastructure development, industrial development, and resource exploitation.[15] For the most part, these nations lack developed environmental legislation and sufficient institutional and administrative capacity to enforce such legislation.[16] Consequently, much of the environmental cost of development is externalized and is borne by the natural environment and its users.[17]

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resources threatens to compromise the welfare gains in East Asia from higher incomes."). East Asia is not alone in having environmental problems from unregulated development. In several nations, the urban air is of such poor quality that oxygen is sold from booths in the streets. *See* Clinton A. Vince, *Integrated Resource Planning: The Case for Exporting Comprehensive Energy Planning to the Developing World*, 25 CASE W. RES. INT'L L.J. 371, 397 (1993) (discussing the practice in Hungary); *The Cost of Not Protecting the Environment*, ATLANTA CONST., Mar. 6, 1991, at A10 (discussing the practice in Mexico); Consortium for International Development, *Proceedings of the Eighth CID Presidential Symposium*, at 4-8 (Occasional Paper No. CID/01/92, July 25, 1991) (stating that "[m]ore than 50 million people are now exposed to hazardous levels of air pollution in [Latin America and the Caribbean]").

14. Environmental degradation may be broken into three categories: 1) unsustainable consumption of natural resources, including land use for agriculture; 2) pollution from manufacturing and from the development and operation of infrastructure; and 3) degradation consequent to large, concentrated populations. Examples of the first category are mining and forestry. Examples of the second are chemical effluents flushed into waterways and coal smoke from a power plant. Examples of the third are degraded water quality from inadequately treated sewage and lead and particulate matter in a city's air.

15. *See* GUNNAR ESKELAND & EMMANUEL JIMINEZ, CHOOSING POLICY INSTRUMENTS FOR POLLUTION CONTROL 2 (1991).

16. *See id.*; David S. Ardia, *Does the Emperor Have No Clothes? Enforcement of International Laws Protecting the Marine Environment*, 19 MICH J. INT'L L. 497, 513 n.72 (1998) (citing Brad Knickerbocker, *World Opens Eyes to Environment*, CHRISTIAN SCI. MONITOR, May 23, 1990, at 6, col. 2 (noting that India's environmental agency has just two lawyers to track lawbreakers); T.M. Sen, *Environment Planning for Industry in the Developing Countries*, 11 INT'L BUS. LAW. 55, 56 (1983) (comparing the relative effectiveness of different countries' regulatory agencies); Karen A. Goldberg, Comment, *Efforts to Prevent Misuse of Pesticides Exported to Developing Countries: Progressing Beyond Regulation and Notification*, 12 ECOLOGY L.Q. 1025, 1030 (1985) ("The entire staff of a ministry of agriculture in a developing country may consist of only one or two people with 'nothing but a motorcycle and no fuel.'") (quoting an interview with L. Caltagirone, Professor of Entomology at the Center for Biological Control, University of California, Berkeley and Advisor to USAID in Central America (May 11, 1984)).

17. In economic terms, absent regulation, the environmental impact of a course of conduct is a classic externality. *See* PAUL A. SAMUELSON & WILLIAM D. NORDHAUS, ECONOMICS 32 (15th ed. 1995); ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE AND POLICY 43-44 (2d ed. 1996). If the environmental consequences of an action, for example, air pollution by a coal-fired power plant, are not included in either the cost of obtaining the inputs to the entity or in the market price of the action's output, the cost is externalized, that is, it is not borne by the party responsible for the polluting action. In this example, the costs of the coal and of fitting the plant to minimize the pollution of the air are typically not included in the cost calculation of the facility, nor are they included in the price of the product, electricity. The result of the externalization is the imposition of a cost upon the environment and on the users of the degraded environment. In the example of the power plant, one such cost is the damage to the water and soil downwind from the plant due to the release of acid rain created by the sulfurous emissions of the power plant. Typically, however, these costs can be internalized by means of regulations which require that the actor harming the environment take precautions to minimize this imposition of costs upon the environment and its users.

Why don't developing nations more effectively regulate environmental degradation within their borders? There are several reasons, the foremost among them are: 1) lack of financial and technical resources; and 2) given the global competition for capital, a reluctance to impede their infrastructure development by imposing the additional cost of environmental regulation upon developers. As a result, the environment and its users in a given developing nation are, in effect, subsidizing the nation's infrastructure and economic base, thereby increasing the nation's competitiveness in the market for foreign and domestic capital.

Developing nations often fail to promulgate and enforce regulations or other mechanisms that would encourage internalization of environmental costs imposed by infrastructure projects because their policy makers believe that including environmental costs in the calculus of a particular project increases the cost of development. To promote economic growth, public environmental resources are often completely sacrificed or allowed to be significantly degraded. These nations fear that higher development costs in the short term will stifle economic growth. In these nations, scarce public financial and technical resources are not allocated to environmental regulation. Developing nations, therefore, have strong economic incentives not to regulate their environments. In fact, they have incentives to use the environment as a form of subsidy for development. To bear out these assertions, this Note examines project finance, a prominent means of development that is increasingly used to construct infrastructure facilities in developing nations. By analyzing how national environmental regulation functions in project finance specifically, this Note draws some descriptive as well as normative conclusions about national environmental regulation generally.

Project finance is an increasingly popular means of developing infrastructure in developing nations[18] and the vehicle by which a significant amount of private foreign direct investment is made in developing nations.[19] Typically, infrastructure facilities significantly impact the natu-

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See ESKELAND & JIMINEZ, *supra* note 15, at 50; PERCIVAL ET AL., *supra*, at 47-48, 133, fig. 2.4.

18. Project finance has been defined as:

> [an] arrangement of debt, equity, and credit enhancement for the construction or refinancing of a particular facility in a capital-intensive industry, in which lenders base credit appraisals on the projected revenues from the operation of the facility, rather than on the general assets or the corporate credit of the promoter of the facility, and in which they rely on the assets of the facility, including the revenue-producing contracts and cash flow, as collateral for the debt.

Scott Hoffman, *A Practical Guide to Transactional Project Finance: Basic Concepts, Risk Identification, and Contractual Considerations*, 45 BUS. LAW. 181, 181 n.1 (1989).

19. *See* UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION, FOREIGN DIRECT INVESTMENT FLOWS TO DEVELOPING COUNTRIES: RECENT TRENDS, MAJOR DETRIMENTS AND POLICY IMPLICATIONS 19 (1990); WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 92-93; FOREIGN DIRECT INVESTMENT IN LATIN AMERICA 42 (Manuel R. Agogin ed., 1995); LAURENCE COCKCROFT & ROGER C. RIDDELL, FOREIGN DIRECT INVESTMENT IN SUB-SAHARAN AFRICA 15-16 (1991); CYNTHIA DAY WALLACE ET AL., FOREIGN DIRECT INVESTMENT IN THE 1990S: A NEW CLIMATE IN THE THIRD WORLD 4 (1990).

ral environment.[20] For the purposes of this Note, the regulation of the environmental effects of project financed infrastructure facilities is pertinent for three reasons. First, these facilities are causing an increasingly larger percentage of the harm to the environment taking place in the developing world. Therefore, a better understanding of how to effectively regulate the environmental impact of these facilities is needed. Second, project finance transactions must effectively allocate all risks and costs in order to increase the chances of the project remaining financially viable. Therefore, project financings are likely to be the "state of the art" of environmental risk and cost allocation. Project finance transactions use a variety of means to allocate both the environmental costs[21] of a project and the risks associated with such costs – the so-called "environmental risk."[22] These methods of allocation are analogous to the range of generally available methods to regulate environmental costs and risks. Therefore, an analysis of these methods in the context of project finance illuminates what will and will not effectively mitigate the environmental degradation caused by economic growth in the developing world. The project financed transaction's

20. *See* WORLD DEVELOPMENT 1994, *supra* note 2, at 21-22; *infra* notes 29-74 and accompanying text.

21. "Environmental costs" can mean two different things. First, it means the costs that are imposed by the decisions of the project's owners and participants to engage in more costly, less environmentally harmful conduct during the course of their business. In this sense, environmental costs are internalizations of the environmental impact of a course of conduct. *See* ASIAN DEVELOPMENT BANK, ENVIRONMENTAL RISK ASSESSMENT – DEALING WITH UNCERTAINTY IN ENVIRONMENTAL IMPACT ASSESSMENT 9 (1991). For example, the cost of putting a scrubber on a smokestack to clean emissions is an environmental cost in this sense of the term. Another example of this first type of cost is the cost of cleaning up an oil spill.

Because project financings are profit-driven, such decisions to assume a cost that otherwise could be imposed on the environment typically are not made spontaneously but instead are prompted by a rule, whether it is a rule of public or private law. An example of the former is a law of the host country mandating that the project emit no more than ten tons of sulfur dioxide a month or else it will be fined. An example of the latter is a contractual obligation owed by one party, A, to another, B, in which A agrees to clean up any oil spills resulting from plant operations. Note, however, that such a contract term probably would not appear unless a public rule mandated cleanup of oil spills, because a rational, profit-seeking party would not choose to impose a cost upon himself unless prompted to do so. In fact, prompting internalization is the goal of environmental policies. *See* ESKELAND & JIMINEZ, *supra* note 15, at 50. Thus, public lawmakers are ultimately responsible for establishing rules to impose the costs of internalizing the environmental impact of particular conduct.

The second type of environmental costs are externalities, the costs of degrading the natural environment and imposing a cost upon its users because of a failure to sufficiently internalize the cost. An example of such a cost is the harm to the soil, water and wildlife from an oil spill. Additionally, any residual damage that remained after any clean-up of the oil spill would also be an externality and an environmental cost in the second sense of the term.

22. Environmental risk can be defined as the probability that the cost of any degradation of the natural environment caused by the operation of a facility will be imposed upon the stakeholders in that facility by public or private law or other means. *See* ALBERT R. WILSON, ENVIRONMENTAL RISK: IDENTIFICATION AND MANAGEMENT 24 (1991); Eugene W. Goodwillie Jr. et al., *Projects in the 1990s: Risks in Project Finance, in* WHITE & CASE, INTRODUCTION TO PROJECT FINANCE 10-11 (1995).

allocation of environmental risks and costs serves as a useful case study in the process of allocation of these costs generally.

Third, and most importantly, the individual project financed facility is a close analog to the development of industry and infrastructure generally because project financing involves the same parties with the same interests as are generally involved in large-scale development. In the private sector, these parties include: equity investors (including domestic and foreign investors from wealthy developed nations); banks (both domestic and foreign who provide financing for both the construction and the long-term operation of the facility); and insurers (who hedge the project's commercial, political and other risks).[23] In the public sector, the important interests that participate both in project financings and in large-scale development include: the government of the nation hosting the project (which is interested in the provision of services to its people, the provision of an investment that is both appealing to investors and potential investors, and is also interested in the manner in which the environmental commonwealth is disposed of); and the people of the nation (because they are involved as consumers of the output of the facility and as users of the natural environment that is affected by the facility).[24]

This Note begins with the assumption that mitigation of the environmental effects of development is necessary if development is to be sustained.[25] Few would disagree that development should be sustained as long as possible. The only disagreement is about how rapidly development should occur and what degree of environmental damage is consistent with sustainability. Almost unanimously, academics point to international regulation of the environment as the best means of mitigating the environmental effects of the world's development.[26] This Note takes a different position. In fact, it is regulation at the *national* level that will best limit the environmental degradation wrought by development on such a massive scale. With respect to monitoring the environment and allocating environmental risks and costs, developing nations should emphasize the establishment of what can be called environmental infrastructures, legal frameworks that complement their development of physical infrastructures of roads, ports and power plants.[27] Specifically, developing nations must

23. *See infra* note 100 and accompanying text.

24. *Id.*

25. Sustainable development is development that meets "the essential needs of the world's poor" yet will not disable "future generations [from meeting] their own needs." WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, OUR COMMON FUTURE 43 (1987), *cited in* SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL LAW 58 (Winifred Lang ed., 1994) [hereinafter OUR COMMON FUTURE].

26. *See, e.g.*, Trends in International Environmental Law 11, 112 (Harvard Law Review eds., 1992); VED NANDA, INTERNATIONAL ENVIRONMENTAL LAW & POLICY 4-5, 309 (1995); INTERNATIONAL ENVIRONMENTAL LAW ANTHOLOGY 7-8 (Anthony D'Amato & Kirsten Engel eds., 1995); JONAS EBBESON, COMPATIBILITY OF INTERNATIONAL AND NATIONAL LAW xviii (1996); BERND RUSTER & BRUNO SIMMA, 1 INTERNATIONAL PROTECTION OF THE ENVIRONMENT: TREATIES AND RELATED DOCUMENTS iii (1975).

27. In this respect, the Author concurs with the environmental lawyer who, speaking of the 1992 United Nations climate convention's non-binding declarations' effect upon

establish effective national environmental regulatory infrastructures (NERI)[28] to police their nations' environments. However, because of their lack of financial and technical resources combined with the disincentive, given the competition for capital, to increase the cost of their development, the developed world must contribute substantial financial and technical assistance to achieve this result.

Part I of this Note discusses the environmental impact of the rapid growth of infrastructure in the developing world. Part II outlines the expansion of foreign direct investment, in particular the increasing use of project finance to develop infrastructure. To illustrate that existing methods of environmental regulation are insufficient to ensure even basic protection of the environments of both individual developing nations and the globe, Part II then evaluates the various methods used to allocate environmental risk in project financed transactions. Part III proposes that the best way to manage the environmental effects of infrastructure development is to develop NERIs in developing nations. Next, this Part sets out one possibility for the development of national environmental regulatory systems, with specific examples from individual developing nations. Finally, Part III addresses several of the central challenges to the development of effective NERIs and recommends that particular features be included in these NERIs.

I. The Environmental Impact of Large-Scale Development in the Developing World

Developing nations suffer from massive environmental degradation as a consequence of the construction of infrastructure and exploitation of their resources without commensurate planning to mitigate the environmental effects of this development.[29] Compounding the environmental degradation, developing nations contain roughly eighty-five percent of the world's population. This already high percentage is increasing, and this rate of population growth compounds these problems because the larger the population, the greater the demand for development and the consumption of

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regulation of the environment, stated that they would serve as, "[t]he foundation for meeting the challenge . . . but it needs the mortar and the bricks to get beyond the basement." PERCIVAL ET AL., *supra* note 17, at 1265. National regulatory systems are that mortar and brick. *See also* William Wilson, *Environmental Law as Development Assistance*, 22 ENVTL. L. 953, 966 (1992) (arguing that "much more needs to be done to give developing countries the capacity to enact and implement environmental laws on a par with those of the developed world . . . [because w]ithout this, there will always be a missing link in the global chain of environmental protection.").

28. *See infra* Part III. An effective NERI would include, at a minimum: a comprehensive environmental health strategy; comprehensive environmental legislation; regulations implementing that legislation; an administrative agency with laboratory facilities, sufficient enforcement and compliance monitoring capacity, and with effective coordination with other national administrative agencies and any sub-national government authorities with environmental responsibilities. *See* ENVIRONMENTAL MANAGEMENT IN DEVELOPING COUNTRIES 250 n.30 (Denizhan Erōcal ed., 1991).

29. *See infra* notes 32-68 and accompanying text.

resources.[30] Additionally, as these populations grow and become more concentrated, managing the harms they impose upon the environment becomes more difficult and costly.[31]

A. Nine Categories of Environmental Degradation

There are nine types of environmental degradation that continue to take place around the world as a consequence of nations' development.

- *Deteriorating Air Quality*
  The combustion of fossil fuels for power generation and transportation exposes about 1.3 billion urban residents worldwide to air pollution levels above recommended limits.[32] Daily, people breathe air that contains levels of sulphur dioxide, lead and suspended particulate matter (SPM) that exceed World Health Organization standards.[33] The problems associated with air pollution include: human health problems, such as increased colds and rhinitis, chronic bronchitis, emphysema, lung cancer, and lead poisoning;[34] animal health problems from pollutants, such as sulfur or metals that precipitate out of the air in the form of acids or other toxins, and that poison downwind bodies of water and soil;[35] and negative effects on materials, such as metals, stone or concrete.[36]
- *Deteriorating Water Quality*
  Defects in water quality occur because of surface and underground water pollution. As a nation develops, it moves from polluting the water with "human and animal wastes, pathogenic organisms from this waste, and sediment from unsound farming and timbering practices" to polluting it with those things plus "heat, toxic metals, acids, pesticides, and organic chemicals."[37] For example, power generation causes significant water pollution from coal mining run-off and heat discharges made by the power plant's cooling systems.[38] A survey of rivers in developing countries during the 1980s showed that their water quality, as measured by dissolved oxygen, was steadily worsening.[39] As to health effects, the "use of polluted waters for drinking and bathing is one of the principal

30. *See* WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 26.

31. *See* Frances Cairncross, *Environmental Pragmatism: Environmental Damage in Underdeveloped Countries*, FOREIGN POLICY, Jun. 22, 1994, at 35.

32. THE WORLD BANK, WORLD DEVELOPMENT REPORT 1993: INVESTING IN HEALTH 96 (1993) [hereinafter WORLD DEVELOPMENT REPORT 1993].

33. Richard L. Ottinger, *Energy and Environmental Challenges for Developed and Developing Countries*, 9 PACE ENVTL. L. REV. 55, 65 (1991); WORLD DEVELOPMENT REPORT 1993, *supra* note 32, at 96.

34. DANIEL D. CHIRAS, ENVIRONMENTAL SCIENCE – ACTION FOR A SUSTAINABLE FUTURE 343-44 (1991).

35. *Id.* at 345.

36. *Id.* Note that each of these effects carries high economic costs – i.e. health care, loss of animal resources, deterioration of buildings and other assets.

37. CHIRAS, *supra* note 34, at 377; WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 45-47.

38. *See* Ottinger, *supra* note 33, at 68.

39. *See* WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 46.

pathways for infection by diseases that kill millions and sicken more than a billion each year."[40] Additionally, pollution kills or toxifies fish and shellfish that would otherwise be an essential part of the diets of billions of people and provide many millions with a livelihood.[41]

- *Atmospheric Change*[42]
  Global warming and ozone depletion are the two primary environmental concerns for the future. Global warming is caused by a buildup of carbon dioxide and other gasses in the atmosphere.[43] Carbon dioxide is believed to be the primary greenhouse gas and is a by-product of human activities such as burning fossil fuels.[44] Carbon dioxide in the atmosphere acts as a blanket, trapping heat that would otherwise dissipate into space.[45] The predicted effects of global warming are reduced grain and other agricultural production; more frequent forest and grassland fires; and a reduction in the polar ice caps, inundating coastal areas.[46] Ozone depletion is caused by increasing levels of chlorine in the atmosphere which chemically interacts with the ozone, thereby depleting it.[47] Although difficult to predict, ozone depletion and increased ultra-violet radiation may have long term consequences such as health problems and less productive fishing and agriculture development.[48]
- *Environmental Deterioration in Urbanized Areas Consequent to Population Growth*
  By the year 2000, it is projected that at least twenty-two cities around the world will have populations over ten million and sixty more will measure over five million.[49] Population alone, even if well managed, creates environmental problems. The demand for and consumption of resources as well as the disposal of waste correlates with population growth. Tens of millions of city dwellers now suffer from polluted air and a lack of clean water.[50]
- *Soil Degradation and Deforestation*
  It is estimated that "somewhere between 30% and 50% of the world's forests have already been destroyed. . . ."[51] Extensive logging or surface mining results in erosion of the soil that was formerly held in place by

40. *Id.* at 48.
41. *Id.* at 46.
42. *See id.* at 61-63.
43. *See* CHIRAS, *supra* note 34, at 346 ("Between 1870 and 1989, global concentrations of CO^2 increased 21.5% (from 290 to 352 parts per million). . . . The best global climate computer models predict that a doubling of CO^2 will increase the average daily temperature by about 2° to 5°.").
44. *See* WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 61.
45. *See id.* at 61, box 2.4.
46. *See* CHIRAS, *supra* note 34, at 346-49; WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 62.
47. *See* CHIRAS, *supra* note 34, at 360.
48. *See* WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 62.
49. *See* CHIRAS, *supra* note 34, at 105.
50. *See* HAMMER & SHETTY, *supra* note 13, at 4. The problem that Hammer and Shetty describe in East Asian cities is common to cities throughout the developing world. *See* Ottinger, *supra* note 33, at 65.
51. *See* CHIRAS, *supra* note 34, at 194.

the trees or the surface soil.[52] The runoff of soils into streams and bodies of water results in damage to fisheries and causes siltation of dams, irrigation systems, and transport channels.[53] Deforestation is also harmful because of another ecological function of trees: trees provide a habitat for various species of wildlife; regulate the hydrologic cycle by influencing watershed flows of surface and groundwaters; and take carbon out of the atmosphere.[54]

- *Destruction of Biological Diversity*

  Biological diversity is a "composite of genetic information, species, and ecosystems. . . [It] provides material wealth in the form of food, fiber, medicine, and inputs into industrial processes."[55] Development and its residual pollution destroy individual species as well as whole ecosystems. For example, the decline of a fruit bat in Malaysia in the 1970s was caused by shrimp farmers' conversion of the swamps where the bat fed, as well as by quarrying in the limestone caves where the bat lived.[56] This species of bat pollinated the fruit-bearing durian trees that were the heart of a $100 million-dollar-a-year fruit industry and the bat's demise resulted in a fall-off in fruit production, jeopardizing the industry's future. When the bat's importance was realized, efforts were taken to ensure that it had adequate food and cave space. Eventually, the bat and the fruit trees recovered.[57] These complex linkages between different parts of the natural system are the unforeseeable results of large scale development that alters the natural environment.

- *Deterioration of Coastal Resources (particularly wetlands, coastlines, and estuaries)*[58]

  Because waterfront property is highly valued for both its aesthetic value and its commercial potential, coastal regions such as estuaries are prime locations for development. Wetlands are often viewed as just "swamps" and draining and developing them is perceived as a more valuable use of the land.[59] The fact that these areas are among the most important for the generation and sustenance of both water- and land-dwelling creatures often goes unrecognized.[60] In addition to serving as breeding grounds for fish and other wildlife, wetlands absorb excess water, restoring groundwater supplies, and filter out the fertilizers used in agriculture.[61] Similarly, estuaries are an integral part of the life cycles of about two-thirds of all fish and shellfish species.[62] They also filter out pollutants from upstream, including agricultural fertilizers, sewage, and

52. *See id.* at 196.
53. *See id.* at 145.
54. *See id.*
55. WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 59.
56. *See id.* box 2.3.
57. *Id.*
58. *See* Consortium for International Development, *supra* note 13, at 4 (discussing the problem in Latin America and the Caribbean).
59. *See* CHIRAS, *supra* note 34, at 231.
60. *See id.* at 230-31.
61. *See id.* at 230.
62. *See id.* at 232.

industrial waste.[63] Development of wetlands often destroys their function as a natural habitat because they are partially or completely drained to make way for housing, recreation, or industrial facilities.[64] Development of estuaries often results in pollution with petroleum products or siltation from upstream soil erosion.[65] Also, upstream use of the water from a river that empties into an estuary makes the brackish water of the estuary too salty to sustain the species that depend upon it for their habitat.[66]

- *Pollution from Agro-chemicals*
  Agriculture in developing nations increasingly involves toxic chemical fertilizers and pesticides, many of which are banned in developed countries for health reasons. These toxic agents are washed into streams and bodies of water, polluting them and causing health hazards to humans and wildlife.[67]
- *Deterioration of the Natural and Cultural Heritage of Indigenous Communities*
  One commentator has observed that, "[e]thnic groups and indigenous communities whose survival is linked to traditional uses of natural resources are now in serious danger of disappearing because of changes in their habitats and acculturation. The search for and development and utilization of . . . natural resources, and the incursion of settlers into indigenous lands have seriously impacted native peoples."[68]

As this list indicates, there are tremendous environmental consequences to the large scale development taking place throughout the developing world. These consequences are extremely costly to individuals, nations, and the global community. The next section describes the massive environmental effects of only one development project in order to demonstrate the scale of degradation involved in the development of three quarters of the world.

B. The Three Gorges Dam

The Three Gorges Dam project in China is a recent example[69] of a development project's impact on the environment. This single hydro-electric power

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63. *See id.*
64. *See id.* at 231.
65. *See id.* at 232.
66. *See id.*
67. *See* Consortium for International Development, *supra* note 13, at 6 (discussing the problem in Latin America and the Caribbean); RAUL BRAÑES, INSTITUTIONAL AND LEGAL ASPECTS OF THE ENVIRONMENT IN LATIN AMERICA 3 (1991).
68. Consortium for International Development, *supra* note 13, at 7.
69. For numerous other examples, see Stephanie C. Guyett, Note, *Environment and Lending: Lessons of the World Bank, Hope for the European Bank for Reconstruction and Development*, 24 N.Y.U. J. INT'L L. & POL. 889 (1992), *citing* PHILLIPPE LE PRESTRE, THE WORLD BANK AND THE ENVIRONMENTAL CHALLENGE (1989); STEVEN HELLINGER, AID FOR JUST DEVELOPMENT: REPORT ON THE FUTURE OF FOREIGN ASSISTANCE (1988); CHERYL PAYER, THE WORLD BANK (1982); Bruce Rich, *Funding Deforestation: Conservation Woes at the World Bank*, NATION, Jan. 23, 1989, at 73; Zygmunt J.B. Plater, *Damming the Third World: Multilateral Development Banks, Environmental Diseconomies, and International Reform Pressures on the Lending Process*, 17 DENV. J. INT'L L. & POL'Y 121 (1988).

generation project will create a reservoir covering 632 square kilometers, require the relocation of twenty cities and 1.4 million people, inundate 28,000 acres of high-quality farmland, and potentially rob the world of significant archaeological artifacts from one of the oldest inhabited regions and cultures of the world.[70] The Three Gorges area is also a popular visiting spot for tourists as it possesses tremendous natural beauty.[71] The project will deny the downstream inhabitants use of the river for agriculture and fishing, and may cause water quality problems for the area surrounding the dam because there will be insufficient flow in the dammed river to dilute the discharged sewage.[72] Lastly, the dam project threatens to destroy the habitats of four endangered species: the giant panda, the Siberian white crane, a river dolphin, and the Chinese alligator.[73]

These are the environmental effects of only one project in one country. The Three Gorges Dam project, the most massive hydroelectric power-generation plant ever developed with an estimated cost of $35 billion, represents only about three-and-a-half percent of the estimated $1 trillion of infrastructure required in Asia alone in the next decade.[74] The relocation of about 1.4 million people required by the Three Gorges Dam project seems to be a high price to pay. In fact, the relocation will probably cost more than the actual dam construction. What prompted the decision makers to proceed with their plans for the dam in light of the project's massive environmental impact? To answer this question, we must look at the shifting attitudes in the developing world regarding how to balance the relative values of economic development, on the one hand, and environmental preservation on the other.

C. The "Right to Pollute" vs. Sustainable Development

Historically, developing nations perceived a conflict between a desire to develop as rapidly as possible and a belief that the costs of environmental regulation or protection, if imposed, would slow the growth of their economies.[75] As a consequence, developing nations typically have favored expe-

70. *See* Marian E. Sullivan, *The Three Gorges Dam Project: The Need for A Comprehensive Assessment*, 8 GEO. INT'L ENVTL. L. REV. 109 (1995).

71. *See id.* at 119.

72. *See id.* at 118.

73. *See id.* at 120.

74. *See* WORLD INVESTMENT REPORT, *supra* note 3, at 60.

75. Spokesmen for developing nations at the United Nations Conference on the Human Environment, at Founex, Switzerland, June 4-12, 1971, expressed three concerns:

> [1] that the high cost of environmental clean-up and protection programs in the developed countries might significantly reduce the amount of aid available for development assistance and [2] that the capital costs of development would increase as developed countries established new standards for factories and technology being transferred to the developing world and [3] that the infusion of sophisticated pollution control technologies would not only add to development costs but would worsen the problem of inappropriate technology already facing them.

H. Jeffrey Leonard, *Emergence of Environmental Concern in Developing Countries: A Political Perspective*, 17 STAN. ENVT'L L. J. 281, 283 n.4 (1981).

dited development without extensive regulation[76] and have been suspicious of pressure from developed nations to regulate their environments.[77] Developing nations argue that they are entitled to the same benefits as developed nations, which benefitted from externalizing the costs of their own development.[78] Traditionally, the law of nations entitles nation states to this benefit. Sovereignty and "the right to pollute at self-determined levels,"[79] limited only by the principle of *sic utere*,[80] were the central principles governing the relationship between development and environmental conservation.[81] Sovereign developing nations have asserted this right to develop their resources as they see fit, and this right has been

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76. Taiwan's experience is typical. Chow, *supra* note 13, at 257. Chow notes that:

> During the past forty years, Taiwan has transformed itself from an impoverished agrarian society into the world's twelfth largest trader and twentieth largest economy. Taiwan's stunning economic rise has led to equally dramatic, though often ignored, environmental problems . . . . [T]his small island country now confronts catastrophic public health and pollution problems caused by explosive industrial growth that has occurred almost completely unchecked by environmental controls.

Id. (footnotes omitted).

77. Leonard, *supra* note 75, at 282 n.2.

> Sri Lanka's ambassador to the United Nations, at that time President of the United Nations General Assembly, spoke for a majority of developing countries during the early 1970s when he said: "[D]eveloping countries have of late been warned of the price that has to be paid in the form of environmental pollution for industrial development. All developing countries are aware of the risks, but they would be quite prepared to accept from the developed countries even 100 percent of their gross national pollution if thereby they could diversify their economies through industrialization."

Id.

78. There are, of course, counter-arguments. Today, the scale of the development is so much greater than it was when the developed nations industrialized – i.e., from the industrial revolution through the 1950's – that the environmental degradation caused by the development of the vast majority of the planet would be devastating. Moreover, today's pollutants are more toxic than the pollutants emitted by developed nations' development – e.g., nuclear waste, PCBs, dioxin, asbestos – and such super-toxic pollution cannot be permitted. Lastly, in light of what we now know about the environmental consequences of the development of the industrialized countries, it would be foolish and destructive to pollute without regard for the known environmental impact of that pollution.

79. E.B. Weiss, *International Environmental Law: Contemporary Issues and the Emergence of a New World Order*, 81 GEO. L.J. 675, 704 (1993).

80. This is a "common law maxim meaning that one should use his own property in such a manner as not to injure that of another." BLACK'S LAW DICTIONARY 1380 (6th ed. 1990); NANDA, *supra* note 26, at 2 (asserting that "[s]overeignty and the right to pollute at self-determined levels," limited only by the principle of *sic utere*, were the central principles governing the relationship between development and environmental conservation).

81. These principles still figure prominently in the relationship, but to a lesser degree. As the Rio Declaration on Environment and Development stated:

> States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and development 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.

acknowledged by more-developed nations.[82] Some developing nations that have taken this approach and exercised their right to develop without regard to the environmental costs have expanded their economies at rates that far surpass the growth of more developed nations over the past decade.[83]

There has, however, been a shift in the attitude of the global community towards the pollution caused by such development. In response to the widespread degradation of the natural environment resulting from infrastructure development and operation, there has been increasing recognition at both the national and international levels of the environmental costs of development.[84] Consequently, many nations have rejected the traditional "right to pollute" development approach described above and have adopted instead a sustainable development approach. Sustainable development has been defined as "development to meet the needs of the present generation without jeopardizing the ability of future generations to meet their own needs."[85] This approach, unlike the traditional development approach, places a significant economic value on environmental resources consumed or degraded in the process of development. This consumption or degradation is calculated as a cost.[86] By starting to regulate

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See United Nations Conference on Environment and Development, The Rio Declaration on Environment and Development, preamble, U.N. Doc. A/Conf.151/5/Rev.1, 13 June 1992, *reprinted in* 31 I.L.M. 874, principle 2 (1992) [hereinafter Rio Declaration].

82. *See id.*

83. *See* Chow, *supra* note 13, at 257. *See supra* note 12.

84. *See* Leonard, *supra* note 75, passim. It should be noted that development can also lead to substantial environmental benefits as well as costs. Any consideration of the relationship between development and environmental preservation must acknowledge the benefits of the development of facilities for treating sewage, for treating drinking water, and for generating power which results in a decrease in burning of biomass which is often a major cause of deforestation and is also grossly inefficient and polluting. *See* WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 7. Such facilities, however, are not always beneficial given the different operating conditions in developing nations. *See, e.g.*, Alexander Shille, *The Ganges' Next Life*, NEW YORKER, Jan. 19, 1998, at 58 (mentioning inoperability of Western designed and built sewage treatment plants due to frequent power outages).

85. BRAÑES, *supra* note 67, at 5.

86. One of the obstacles to accounting for environmental costs is the difficulty of evaluating those costs. Traditionally, the success of a nation's development program is measured using market-based economic criteria, such as Gross National Product or household income, that do not reflect the cost or value of harm to or protection of the nation's natural environment. WILLIAM RYRIE, FIRST WORLD, THIRD WORLD 219 (1995). While markets are effective devices for evaluating many goods and services, they tend not to be effective at evaluating environmental costs.

> Markets frequently do not accurately reflect the social value of the environment, for several reasons: [1] No market exists because it is difficult to enforce the rights to own or use the environment – as with air quality. Thus, prices do not reflect the adverse effects of pollutants, and the result is too much air pollution. [2] Some uses for a resource are marketed but others are not – as with tropical rainforests, where timber is marketed but watershed protection is not. The nonmarketed benefits are frequently ignored, while other uses of the resource are overexploited. [3] Open access to resources allows them to be exploited by all – as with rainforests in the Amazon and sardines off the coast of Costa Rica. In these instances, environmental effects are not recognized by users (and so

the environmental effects of infrastructure development, many developing nations are acknowledging that management of environmental resources is crucial to their future,[87] and that degradation of the environment carries with it high costs that must be taken into account.[88]

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become externalities). The results are deforestation and overfishing. [4] Individuals and societies lack information about environmental impacts or about low-cost ways to avoid damage – as with the link between CFCs and ozone depletion, which is only now fully appreciated. Private firms may not provide better information because they find it difficult to capture the benefits.

WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 64-65.

87. In addition to environmental consciousness, international economic and political forces are pushing developing nations to regulate their environments. Consumer demand for "greener" products in the export-market, typically developed countries, has led to increased regulation of manufacturing in developing nations. Thus, global competition has been pushing developing nations to meet higher environmental standards in their products and processes or lose export business. DEVELOPMENT ASSISTANCE COMMITTEE, ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, DEVELOPMENT COOPERATION – 1994 REPORT 43 (1994). However, developing nations are suspicious that the developed nations' pressure upon them to increase environmental regulation is indirect trade protectionism. *Id.* ("A broad concern is that environmental claims may be misused to try to justify damaging protectionist impulses."). Environmental regulation of imports by more developed nations is seen to stem from protectionist motives, specifically, from developed nations' desire to protect their domestic producers from the producers in less developed nations because the domestic producers have additional costs imposed by environmental regulations.

Politically, international concern for the environment, particularly on the part of the more developed nations, has put pressure on less developed countries to enact more environmental legislation. Developed nations, which have contributed substantially to protecting the global commons through enactment of legislation and enforcement (and, increasingly, with international regulation and enforcement) do not want pollution by unregulated developing nations to negate their efforts. *See Foreign Operations, Export Financing, and Related Programs Appropriations for Fiscal Year 1996: Hearings on H.R. 1868 before the Subcomm. on Foreign Operations, Export Financing, and Related Programs of the Senate Comm. on Appropriations*, 104th Cong., Pt. II, 11 (1994). One U.S. official has observed that:

> [w]hen we in the U.S. and other developed countries have done all we responsibly can do to protect the atmosphere and safeguard our shared oceans and seas and the global commons from which we draw many of the products and the materials we need, [it is important that] our efforts are not negated by the unregulated industrial and other actions of the populous developing world, the former Soviet Union, and other countries.

Id. (Statement of Richard N. Hellman, President, U.S. Committee for the United Nations Environment Program).

88. DEVELOPMENT ASSISTANCE COMMITTEE, *supra* note 87, at 46.

> As in the advanced countries, many Third World governments have established programs and passed regulations to protect the environment and have created new government agencies responsible for environmental affairs. A 1980 survey by the Center for International Environmental Information noted that 102 developing countries now have governmental agencies with environmental management responsibility, whereas only eleven Third World governments had such agencies in 1972.

Leonard, *supra* note 75, at 282 (footnotes omitted). Governments in developing nations, in the face of environmental harms caused by development, have "respond[ed] with environmental legislation, strengthened environmental protection institutions, and increased enforcement." INTERNATIONAL FINANCE CORPORATION, INVESTING IN THE ENVIRONMENT iii (1992).

Project finance is increasingly being used to fund infrastructure development in developing nations. Examining the means by which the negative environmental effects, as well as the risk of those effects, of project financed infrastructure transactions are accounted for is a valuable case study through which to observe the significant relationships between this emerging environmental consciousness and the desire to both promote economic growth and generate profits.

II. Project Finance and the Development of Infrastructure in Developing Countries: A Case Study[89]

Historically, infrastructure projects have been public works funded by public monies, usually either tax revenues or proceeds from bond sales.[90] Infrastructure projects were typically too costly for any private concern to undertake because of the large initial capital outlay, the slow rate of return, and the risk that the project would never be profitable. In the past twenty years, however, infrastructure development has increasingly become "private works." More of the money invested in developing nations comes from private sources and less from the public sector.[91] Additionally, this private funding increasingly comes from outside the developing nation in the form of foreign direct investment.[92] Building infrastructure now yields suffi-

89. The following treatment of the subject of project finance is at a level of detail that serves only my purpose of demonstrating that the environmental consequences of infrastructure development are not sufficiently regulated. For more detailed analyses of project finance, see PETER NEVITT, PROJECT FINANCING (5th ed. 1989), the numerous articles cited in Jay Facciolo, *Project Finance*, 11 B.U. INT'L L.J. 169, n.13 (1993) (reviewing CLIFFORD CHANCE, PROJECT FINANCE (1993)), and the articles cited in Hoffman, *supra* note 18, at 181, 182 n.2.

90. Even with private funds accounting for an increasing amount of infrastructure development, the vast majority of infrastructure development is still public. *See* WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 89 ("Developing countries now spend around $200 billion a year on infrastructure investment, some 90 percent or more of it derived from government tax revenues or intermediated by governments. The burden on public finances is enormous."). There is so much infrastructure needed in the world, particularly in developing nations, that even a minority of that development implicates hundreds of billions, if not trillions, of dollars, and impacts the quality of the environment in which billions of people live.

91. GARY BOND & LAURENCE CARTER, INTERNATIONAL FINANCE CORPORATION, FINANCING PRIVATE INFRASTRUCTURE PROJECTS IX (1991) (stating that private financing "and management of infrastructure in developing countries is undergoing a renaissance as governments in many countries give the private sector a larger role in providing infrastructure services.").

> The private investment-to-GDP ratio in developing countries rose by more than a full percentage point to 18% and now stands some 6% higher than the low reached in the middle of the 1980's. Public investment-to-GDP ratios continued to slide. In 1994, average public investment rates in developing countries were down to 6% of GDP – far below their average level of around 10% in the late 1970's.

FREDERICK Z. JASPERSEN, INTERNATIONAL FINANCE CORPORATION, TRENDS IN PRIVATE INVESTMENT IN DEVELOPING COUNTRIES: STATISTICS FOR 1970-1994, at 1 (1995).

92. BOND & CARTER, *supra* note 91, at ix. Because foreign direct investment is an increasing part of the total capital invested in developing nations, including capital investment for infrastructure, attracting foreign capital is very important for the eco-

cient profits to attract foreign investment capital to more risky developing nations. The most important legal and financial means by which this shift to private development has taken place is project financing.[93] To be successful, a project financed facility must generate sufficient cash flows from its operations both to service all of its obligations and to provide an adequate return on the project sponsors' investments.[94]

Project sponsors' exposure to liability for the obligations of the project, however, is very limited. If the cash flows are not sufficient to meet the obligations of the project, creditors have limited or no recourse to the sponsors to recoup any losses they may suffer as a consequence of the project's non-performance.[95] In fact, it is a sponsor's wish to participate in a project

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nomic future of any particular developing nation. While developing nations frequently employ private foreign direct investment to develop their infrastructure, the reasons given for this increase vary. Some commentators say that private capital is used more because the bargaining power of developing nations is greater. *See, e.g.*, CYNTHIA DAY WALLACE ET AL., FOREIGN DIRECT INVESTMENT IN THE 1990'S: A NEW CLIMATE IN THE THIRD WORLD 4 (1990) ("[One] explanation for the more positive attitude toward foreign investment is that host governments in developing countries have become more confident in dealing with MNC's."). Other commentators believe that the reason for the increase in private foreign direct investment is due to developing countries' need and the lack of alternatives after the credit squeeze of the 1980s, when restructuring of both private debt and public development aid took place. *See, e.g.*, Gerald Pollio & Charles H. Riemenschneider, *The Coming Third World Investment Revival*, HARV. BUS. REV., Mar.-Apr. 1988, at 114, 118 ("[M]any financing options previously available to the Third World have dried up."). This difference between the explanations is important because it bears on relative bargaining power of the host nation and the foreign investor which, in turn, affects the choice a given nation will have of whether to impose costly environmental regulations upon infrastructure projects.

93. There are several reasons why project finance is increasingly used to fund infrastructure development. One factor is the trend to privatization of infrastructure. *See* BOND & CARTER, *supra* note 91, at 1-3; SYMPOSIUM, *supra* note 3, at 11-15. Further, under-investment by many nations' utilities has left a backlog of unmet demand for infrastructure services which hampers economic growth. *Id.* at 3. The reluctance of the governments of developing nations to take on more debt also steers countries to foreign investment. *See* WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 91 ("Where budgets have been tightened for macroeconomic reasons, the large share that infrastructure represents in government investment has led to proportionately sharp reductions in spending in this sector."). In project financed transactions, "[t]he host countries benefit by getting the needed infrastructure without incurring more sovereign debt." Pollio & Riemenschneider, *supra* note 92, at 124. The reluctance of lenders in the developing world, both public and private, to give aid or make loans to developing nations, leads to the project finance solution. *Id.* at 114, 118 (identifying a "contraction of alternative sources of private capital [for the Third World] – above all loans from commercial banks."). Last, the development of innovative legal and financial techniques and the globalization of financial markets presents more opportunities for innovative uses of capital. *Id.*

94. *See* OVERSEAS PRIVATE INVESTMENT CORPORATION, 1995 ANNUAL REPORT 6 (1995); The entity carrying out the construction and often the operation of the facility is called the promoter, sponsor, or the "special purpose corporation" (SPC) and is brought into existence solely for the duration of a particular project. *Id.* Such projects are "normally developed by forming a new company that has no other assets and no previous performance or credit standing." Robert Thornton Smith, *Submission and Evaluation of Proposals for Private Power Generation Projects in Developing Countries*, 707 PLI/Comm 183, 195 (1993). Hence the name, "project finance."

95. *See* GRAHAM VINTER, PROJECT FINANCE 111 (2d ed. 1998).

with less exposure to project risks than he would incur if he managed the transaction either out of corporate debt or by contributing significant amounts of equity to the project that is usually the primary motivation behind the project finance structure.[96] That structure usually requires a non-recourse or limited recourse loan, which means that:

> lenders are repaid only from the cash flow generated by the project or, in the event of complete failure, from the value of the project's assets. Lenders may also have limited recourse to the assets of a parent company sponsoring a project. An important policy question is whether the government [that is hosting the project's] tax revenues should be used to provide recourse, in the form of guarantees to lenders.[97]

The non-recourse nature of project finance means that a sponsor's other assets are not put at risk by the success or failure of the specific project.[98] Therefore, a sponsor may have a stake in the project's profits but will have either no liability for the obligations of the project company beyond the risk of losing his initial investment in the entity, or will have only limited liability for those obligations.[99]

A project financing involves several different parties, each of which agrees to bear certain project risks in exchange for certain benefits, financial or otherwise. The principal parties to a project financing include:

> the Host Nation's Government, the Project Sponsors (i.e. developers and active equity holders), Equity participants (i.e. passive equity holders), Lenders (for both the construction and the permanent), Contractors (general, sub-contractors, equipment suppliers), Operators [of the project facility], and Credit Enhancers (commercial insurers, specialty insurers – e.g. political risk insurers and export credit insurers – performance bond issuers and sureties, guarantors, letter of credit issuers). In many projects, there are additional participants such as: technology owners, suppliers of inputs to the project, offtakers and other users of project products.[100]

In international project finance transactions, a complex system of contracts determines the relationships between these various parties.[101] This system of contracts in a basic project finance structure will generally include the

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96. P.D. Slattery, *Project Finance – An Overview*, 6 CORP. & BUS. L.J. 62 (1993). Other reasons why a sponsor would select a project finance structure are:

> (i) elimination of, or limitation on the recourse nature of the financing of a project, (ii) off-balance sheet treatment of debt financing, (iii) leverage of debt to avoid dilution of existing equity, (iv) avoidance of restrictive covenants in either debt or equity arrangements that would otherwise preclude project development, and (v) arrangement of attractive debt financing and credit enhancement, available to the project itself, but which is unavailable to the project sponsor as a direct loan.

Hoffman, *supra* note 18, at 184.

97. WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 94.

98. *See* Hoffman, *supra* note 18, at 185.

99. Of course, a sponsor could not avoid liability in the event that he made fraudulent representations in connection with the financing. *See generally* S. WILLISTON, A TREATISE ON THE LAW OF CONTRACTS §§ 1486-1509 (3d ed. 1970 & Supp. 1988).

100. EUGENE W. GOODWILLIE, JR., PROJECTS IN THE 1990'S: RISKS IN PROJECT FINANCE 1 (1993)

101. *See* VINTER, *supra* note 95, at 23.

following: 1) *a concession agreement* in which the host government grants the project company a long-term right to engage in the relevant industry;[102] 2) *an output or offtake agreement* in which the host country agrees to purchase the total output of the project, or at least a fixed amount;[103] 3) *an engineering, procurement, and construction contract* in which the project company agrees with the contractor on the terms and specifications for construction of the facility;[104] 4) *financing agreements* between the project company and the lenders, public and private, to fund the project and provide debt service out of the proceeds of the sales agreements with the host government and any other sales commitments;[105] and 5) *a fuel contract* guaranteeing a supply of fuel to the facility to ensure that the facility can operate and that the operating costs are more certain.[106] A project may also include an agreement with an operator/manager of the facility if the sponsor does not perform those functions itself.[107] The goal of this system of contracts is to plan the project as certainly as possible in order to minimize the risk that the project will not generate the cash flows necessary to pay operating costs, service debt, and provide a return to the sponsors.[108] A well-executed project financed transaction balances the competing interests and tolerances for risk of the many different parties involved.[109]

In project financed transactions, the financial risks of costly, capital-intensive infrastructure projects are distributed amongst numerous parties with interests in a particular project.[110] As noted above, project finance "requires a clearer delineation of risk than is the case with traditional pub-

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102. *See id.*

103. *See id.* at 66. In order to secure the host government's obligations under the sales contract with the project company, the central bank of the nation, owned by the national government, may provide a limited payment guarantee to the lenders. *See* Hoffman, *supra* note 18, at 90.

104. *See* VINTER, *supra* note 95, at 23-24.

105. *See* Goodwillie et al., *supra* note 24, at 13.

106. *See* VINTER, *supra* note 95, at 24.

107. If the transaction is a "Build-Own-Transfer," or "BOT," model, there will be a transfer agreement in which the project company agrees to allow the host government to purchase the project after a period of years sufficient for the project revenues to pay back the lenders and provide a return on the SPC's investment. *See* Smith, *supra* note 94, at 190.

108. Stuart Rauner, *Project Finance: A Risk Spreading Approach to the Commercial Financing of Economic Development*, 24 HARV. INT'L L.J. 145 (1983). Contracts allocate the legal rights and obligations each party bears with respect to each other, and allocate the variety of risks involved in the transaction. *See* VINTER, *supra* note 95, at 23; Rauner, *supra*, passim.

109. Creating this type of complex contractual system takes a long time to negotiate and carries high transaction costs:

> With deals that frequently involve billions of dollars of capital, and protracted, fiendishly complex negotiations, project finance provides premium fees to the dozen-odd firms in the U.S. and England that dominate the market worldwide .... In the $1.9 billion Hub River power project in Pakistan, which closed in 1995 after eight years of negotiations, total legal fees for all firms were 'clearly more than $10 million.'

John E. Morris, *A Rival to M&A? Project Finance Comes of Age as Developing Nations Turn to the Private Sector for Major Infrastructure Development*, AM. LAW., Apr. 1996, at 26.

110. *See* Rauner, *supra* note 108, at 145; Slattery, *supra* note 96, at 62.

lic projects"[111] because it involves so many different parties and involves such large capital outlays. Risk must be identified, evaluated, and allocated among the various parties because if the risk in a project is either unknown or too great, lenders will not finance the project.[112] The fundamental principle for allocation is that "the participant that can best exercise control over a risk or that will realize the greatest reward if the risk does not materialize . . . [should be] allocated the risk."[113] If there is too much risk relative to the expected return on the project, the financing will not be forthcoming, the project will not take place, and the projected service will not be provided for the host nation.[114] Thus, failure to agree to a particular allocation of the project's risks amongst the principal parties is often a cause of the failure of project financed transactions in developing nations.[115]

A. Environmental Risk

Of the several different kinds of risks presented by international project financed transactions,[116] this Note is concerned with environmental

111. WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 94.

112. Due to the non-recourse nature of most project financed transactions, lenders perform a great deal of due diligence before lending any funds. *See* Hoffman, *supra* note 18, at 190. The corporation and contractors that are parties to the transaction are concerned because unexpected significant environmental costs can render transactions unviable, particularly in a finely-tuned project finance deal that hinges on the long term viability of the project for payback and profits. Risk, "unless subject to ascertainable limits . . . can render a project unbankable because lenders [or other parties] are not likely to undertake unpredictable or unquantifiable liabilities." VINTER, *supra* note 95, at 117.

113. Hoffman, *supra* note 18, at 194.

114. *See id.*

115. *See id.*

116. The sum of the varieties of risk in project finance transactions has been called the "project risk." Smith, *supra* note 94, at 192. Individually, there are three varieties of risk.

1) Commercial Risk:
Commercial risks relate to potential problems during construction, such as cost and schedule variations (completion risks); to problems in the operation of the plant, such as might stem from faulty operation or poor performance (operational risks); and to potential failures to generate cash flow or meet demand (supply and market risks).

Id. at 196.

2) Political or Country Risk:
"Political or country risks are specific to the host country and may include currency and foreign exchange risks, governmental default on contractual obligations, expropriation [of the property or other rights of the project], and civil turmoil." *Id.* Political risks may also arise "from actions or failures to act by governments which are not in accordance with local and/or international law."

GOODWILLIE, *supra* note 100, at 14.

3) Force Majeure Risk:
"Typically, force majeure events are defined as circumstances not within the reasonable control of the party affected which prevents performance of such party and which, despite the exercise of reasonable diligence, such party is unable to prevent, avoid or remove." *Id.* Examples are natural disasters such as earthquakes, hurricanes or other acts of God.

risk.[117] Environmental risk is the probability that environmental liability will result in the imposition of a cost upon one or more of the project's principal participants.[118] Such a cost could occur if the project, whether in its normal course of operation, because of abnormal operation, or as a consequence of a catastrophic accident: (1) fails to adhere to a legally or contractually imposed standard of environmental compliance (such as standards for emissions, levels of site contamination or major hazards due to an accident); (2) fails to maintain a level of productivity that ensures the profits of the project;[119] or (3) fails to maintain a sufficient public good will for the project, causing either diminished use or rejection of its services (such as a boycott because of pollution by the facility) or demands for its termination.[120] Failure to comply with any of these normative standards, which can occur independently or in combination, jeopardizes the project because the funds re-allocated to address the environmental issue would otherwise be used to pay back the project financing and provide a return on the owners' investment.

Environmental costs can make a transaction unbankable, particularly in a finely-tuned project finance deal that hinges on the long term viability of the project for payback and profits.[121] Therefore, the potential environmental liability – the environmental risk – of a facility must be ascertained prior to the development of the facility. A plant, for example, that does not comply with existing or future environmental regulations in the host nation may incur environmental liabilities that render its financing impracticable, denying the host nation the service that a viable facility would have provided.

Environmental risk can affect every project participant.[122] Therefore, effective estimation and allocation of the potential environmental risk as well as the known environmental costs in a project are necessary to determine whether the proposed facility will be economically viable. The next

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Note that different types of risk will be of concern only at certain stages of the project – for example, completion risks are only an issue during construction of the facility. Given this, some commentators classify risks temporally, distinguishing design, engineering and construction risks, start-up risks, and operating risks. *See, e.g.*, Hoffman, *supra* note 18, at 193.

117. The potential environmental costs and risks include: (1) *losses to companies and their financiers* such as (a) civil and criminal liability; (b) plant closure, downtime for retrofitting; (c) rejection or delay of contracts and permits; and (d) increased cost of capital; and (2) *risks to financial institutions* such as (a) credit risk – delayed payment or write-offs of loans; (b) position risk – devaluation of company's securities; (c) liquidity risk – loss of market value in liquidation of collateral; (d) legal risk – civil and criminal liability through exercise of control; and (e) funding risk – reduced access to capital from international markets. BOND & CARTER, *supra* note 91, at 32.

118. *See* VINTER, *supra* note 95, at 219.

119. An example of such a failure would be if the project design was flawed or outdated so that both productivity and environmental protection are compromised, and costly environment-protecting redesign or retrofitting are required.

120. Smith, *supra* note 94, at 195.

121. *See* VINTER, *supra* note 95, at 219-20.

122. Eugene W. Goodwillie, Jr. & Troy Alexander, *Project Finance, in* NEW YORK AND DELAWARE BUSINESS ENTITIES 222, 239 (Arthur Norman Field & Mortin Moskin eds., 1997).

section identifies and evaluates the variety of means that are employed to allocate environmental risk,[123] highlighting the shortcomings of each.

B. The Means of Allocating Environmental Risk Among the Parties to Project Financed Transactions

The parties to project finance transactions treat environmental risks in infrastructure projects like other risks: they assess them, mitigate them where possible, and then allocate them amongst the various parties according to who is best able to ensure that the risk is minimized.[124] There are a variety of private and public legal means of allocating environmental risk; each is detailed below, starting with the private legal means.

1. Allocation by Choosing the Project Entity

Choosing the legal form of the project sponsor (such as a corporation or partnership) is an important part of allocating environmental risk.[125] When several different parties are involved as sponsors, they must choose a project entity as a vehicle with which to achieve the project's goals.[126] In

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123. In the following discussion of the various means, I assume that an appropriate allocation of environmental risk would both put the responsibility for mitigating risk under the control of the party best situated to mitigate it and would mitigate environmental harms to a degree that is consistent with either the most stringent environmental standards in the domestic legislation of the host nation or, where national laws are silent, with minimum international standards ensuring healthfulness. My intention in fashioning what is likely a more restrictive, "greener" allocation of environmental risk is not to choke off economic growth in developing nations; rather it is to bring about a more sustainable, healthful, and environmentally conscious development.

Ascher has documented the fact that projects with significant environmental impacts often have lower than anticipated rates of return. WILLIAM ASCHER, COPING WITH THE DISAPPOINTING RATES OF RETURN ON DEVELOPMENT PROJECTS THAT AFFECT THE ENVIRONMENT 1 (1992). He writes that:

> Development projects with significant environmental impacts pose special challenges for developing countries and the international institutions that help finance their development. Whether these projects directly exploit the natural resource base (e.g., timber exploitation) or have an incidental impact (e.g., a highway through a wilderness area), they are often accompanied by distinctive problems that threaten their own overall viability. Even worse, the *ex ante* evaluations of these "environmental impact" projects often ignore the costs, delays and reduced benefits that result from these impacts. Thus, many such projects are launched despite the fact that their returns to the overall economy are often below the cost of capital and – in all too many cases – actually negative.

Id. (footnote omitted).

124. BOND & CARTER, *supra* note 91, at x, xii.

125. Most project financings are structured using either New York or English law. This Note treats the forms available under the American law and not the English. For a brief explanation of the choices of legal form for the project entities available under English law, see VINTER, *supra* note 95, at 8-15.

126. *See id.* at 8. Vinter states that:

> [t]he choice of vehicle will be dictated by, *inter alia*, the following considerations: (a) the extent to which the sponsors wish to be insulated from the risks and liabilities inherent in the project (b) the extent to which the sponsors wish to avoid moneys borrowed for the purpose of funding the project appearing on their respective balance sheets . . . (c) the ease with which profits can be extracted by the sponsors (d) tax efficiency . . . (e) flexibility of management

choosing a legal form, participants must remember that limiting the project entity's liability for obligations incurred for contract performance, tortious behavior, and regulatory noncompliance is important to the viability of the project. Therefore, unless local law prevents it,[127] project owners prefer the use of a limited liability form such as incorporation or a limited liability company over a form of partnership or incorporation as a subsidiary of a parent sponsor.[128] The former forecloses a potential claimant's recourse to the larger corporations, or other owners of the project entity, in the event that environmental costs are incurred by the project company. The latter, however, requires the general partners (or the general partner in a limited partnership) to assume joint and several liability for any harms that result from negligent behavior of the project entity.[129]

Critics of limited liability forms in the project finance context point out that those who "evaluate possible investment options . . . are likely only to consider the marginal costs and benefits associated with the investments that they will be required to internalize."[130] In other words, the project entity can ignore environmental costs associated with the project that do not accrue to the project. This externalization by means of the limited liability form will not appropriately allocate environmental risk because the party in control of the project's polluting, the sponsor or operator, will have no incentive to limit the pollution as long as the project remains sufficiently profitable.[131] Absent imposition of an internal cost, for example by environmental liability, it simply makes no financial sense for the sponsor to limit the project's harm to the environment.

The majority of the special purpose project companies are set up as limited liability companies.[132] Because companies will seek to minimize their liability and will tend to act in their economic self-interest, allocation

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structure (f) the level of minority protection (g) the level of publicity of the vehicles affairs . . . [and] (h) ease of dissolution.

Id. at 8.

127. The legal forms available to the project sponsors for the project entity will depend on the local law of the host country. *Id.* at 12.

128. *See id.* at 16. The rationale for using the limited liability form is similar to the rationale for using a non-recourse structure: limiting the imposition of costs upon the sponsors. Indeed, as we saw above in the discussion of non-recourse financing, limited liability is appealing because sponsors can

> limit their downside risk to the value of their equity investment in the project and the scope of any applicable sponsor support obligation. [This means that] they can undertake major capital intensive projects in high-risk environments without running the risk that a single project failure will bankrupt the company.

Goodwillie & Alexander, *supra* note 122, at 225.

129. N.Y. BUS. CORP. LAW, § 628 (1996); New York's limited liability law provides that "a member of a limited liability company . . . is not liable for any . . . liabilities of the limited liability company . . . whether arising in tort or contract." N.Y. LIMITED LIABILITY COMPANY LAW, Art. VI, § 609 (1996). Domestically, at least in the parent-subsidiary context, the doctrine of "piercing the corporate veil" threatens the limited-recourse nature of project financings. *See* Hoffman, *supra* note 18, at 189-90 & n.19 (1989).

130. Jonathan R. Macey, *The Limited Liability Company: Lessons for Corporate Law*, 73 WASH. U. L.Q. 433, 448 (1995).

131. *See id.*

132. Goodwillie et al., *supra* note 24, at 25.

of environmental risk through the choice of the project entity is insufficient to ensure that development of infrastructure is undertaken with adequate protection of the environment of developing nations.[133] Therefore, host nations should enact national legislation that provides for liability of project sponsors and major shareholders where there is gross undercapitalization of the project entity which leaves environmental claimants unsatisfied or where the sponsors or shareholders make management decisions that foreseeably cause substantial environmental degradation. As the next section shows, another type of private law means of allocation, the insurance contract, is also inadequate to appropriately allocate environmental risk.

2. *Allocation By Means of Insurance*

Commercial insurance is another means of allocating and minimizing environmental risk. Insurance allocates responsibility for any economic costs resulting from environmental harms to the polluter, but minimizes the risks of forcing the individual polluter or an entire class of businesses (for example, plastic manufacturers) into bankruptcy.[134] Insurance against environmental damage is difficult to obtain.[135] Many countries, however, have at least one carrier that offers at least limited pollution insurance coverage.[136] In the United States, for example, one carrier offers a policy that indemnifies the insured for liability for "environmental impairment"[137]

133. It might be argued, however, that in the context of international project finance, the unfairness of permitting the project entity to avoid liability for its wrongs may be offset by the fact that, absent the limitation of liability, the transactions would not occur. However, it is probable that imposing liability would not stop project financing, it would simply alter the pricing of the transaction, increasing it marginally to account for this added risk assumed by the sponsor.

134. One commentator has observed that:

> Legislatures and courts would be – and have been in the past – much more reluctant to place on polluters the full burden of the economic loss caused by pollution if that could result in the polluter being forced into bankruptcy or out of business, with undesirable indirect adverse effects on the supply of manufactured goods, commodities, or energy, or employment, and on the economy generally. Insurance is a device that, while not taking the financial burden completely away from the polluter, just makes it bearable by spreading it over a large number of potential polluters and over time.

Werner Pfennigstorf, *Insurance of Environmental Risks: Recent Developments*, 1982 ABA ENVIRONMENTAL LAW SYMPOSIUM 57, 59 (1982).

135. *See* VINTER, *supra* note 95, at 209 n.1.

136. The limited number of carriers of such insurance bears out the observation that insuring environmental risk is itself very risky because "[m]any claims involving the environment represent a new kind of risk whose nature and dimensions are not yet fully known, which has a tendency to cause harm surreptitiously over long periods of time and which is therefore extremely difficult to manage and to calculate." INTERNATIONAL ASSOCIATION FOR INSURANCE LAW, POLLUTION INSURANCE: INTERNATIONAL SURVEY OF COVERAGES AND EXCLUSIONS 2 (Werner Pfennigstorf ed., 1993) [hereinafter POLLUTION INSURANCE].

137. In the agreement, the term environmental impairment means, in part: "damage to the environment caused by: (1) the emission, discharge, disposal, dispersal, release, seepage, or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids or gases, waste materials or other irritants, contaminants or pollutants, into or upon land, the atmosphere or any other watercourse or body of water . . ." *Id.* at 224.

that is "gradual and fortuitous and neither expected nor intended by the insured."[138] This coverage is available only if the claim establishing liability arises from "environmental impairments" in the United States, its territories or Canada, or, alternatively, if the suit is brought in the United States, its territories or Canada.[139] Moreover, the scope of this insurance is further limited to harms that do not occur as a matter of course and that are not "sudden and accidental."[140] Additionally, because the policy's coverage is limited to liability arising from judgments in the United States or Canada, the project agreements must include a choice of law clause subjecting the parties to American law. However, a host sovereign might not wish to make such a concession.

Currently, no public sector entity provides insurance for environmental risk, although other risks accompanying foreign investment in developing nations are publicly insurable. The creation of the Multilateral Investment Guarantee Agency (MIGA) in 1988 is evidence of a widespread international recognition of the necessity for the public to shoulder certain risks that would otherwise fall upon private entities. MIGA provides insurance coverage for some of the risks arising from international investment in developing nations.[141] MIGA insurance, however, does not cover environmental risk. The risks covered by MIGA include "measures attributable to the host government such as nationalization, confiscation, sequestration, seizure, attachment, and freezing of assets."[142] However, no similar MIGA coverage exists for "[m]easures normally taken by governments to regulate their economic activities such as taxation, environmental and labor legislation. . . ."[143] The insurance coverage of the Overseas Private Investment Corporation is similarly limited to "political risks" such as "Currency Inconvertibility . . . Expropriation . . . [and] Political Violence."[144]

Some sound logic underlies the unavailability of coverage for environmental risk. One reason is the uncertainty of the extent of the potential environmental damage that can be caused by such major infrastructure and industrial projects. Where risks are unknowable and potentially very large, insurers will not provide coverage.[145] The uncertainty surrounding the potential costs of providing coverage for environmental risk means that private insurance providers will likely never provide extensive coverage for environmental harms.[146] Thus, it is unlikely that publicly available insur-

138. *Id.*
139. *Id.* at 225.
140. *Id.*
141. Convention Establishing the Multilateral Investment Guarantee Agency, *opened for signature* Oct. 11, 1985, 24 I.L.M. 1598 (entered into force April 12, 1988).
142. *Commentary on the Convention Establishing the Multilateral Investment Guarantee Agency*, 1 ICSID REV. FOREIGN INV. L.J. 195, ¶ 14 (1986).
143. *Id.*
144. OVERSEAS PRIVATE INVESTMENT CORPORATION, *supra* note 94, at 7.
145. Kathryn E.B. Robb, *Environmental Considerations in Project Financing*, 672 PLI/Comm 565, 593 (1993).
146. This will continue at least until the passage of time permits an empirical basis for determining the scale of the environmental risk involved in project financing of infra-

ance for environmental risk will play a large role in allocating that risk.

Another shortcoming of insurance, when it is available, as an allocative means is that its coverage unavoidably has gaps. These gaps include: the lack of an identifiable polluter; no liability because there is no existing environmental regulation or because a determination of a rule violation has not been made to trigger the policy; the incident is beyond the scope of the policy's coverage; the amount of the policy's coverage is insufficient to remedy the harm; or the insurer is insolvent.[147] One other major problem with insurance from the standpoint of environmental protection is that it is curative and not preventive, and it is curative only to the extent that a complex environmental problem may in fact be cured.[148] When an insurance claim is filed, the underlying environmental harm has already occurred. Therefore, insurance is not preferable to a means of allocation, such as effective environmental regulation, that prevents or deters the occurrence of the environmental harm in the first place.

3. *Allocation by Agreement Between the Parties*

Contractual agreement is another primary means by which the parties allocate environmental risk because agreements may assign responsibility among the parties for compliance with particular environmental standards and for the costs of any failure to comply with those standards. As noted above, project financed transactions are based on a complex framework of contracts that carefully define the respective rights and obligations of the various parties to the transaction. The negotiation of these contracts is a process of "risk spreading" whereby sponsors, lenders, sellers of inputs to the project, users of the project's output, and government agencies become contractually bound to accept certain environmental (as well as other) risks.[149] For example, the credit agreement between the private commercial lenders and the project entity often will include as a condition precedent to financial closing the promise that the project's operation complies with specified criteria that mitigate the project's potential to incur environmental liability.[150]

For at least two reasons, lenders are motivated to require the policing of projects they fund for compliance with environmental standards. First, a bank may not receive its return if environmental risk is not identified and allocated effectively. The cash flows out of which the project's debt is serviced may be impaired or negated by environmental clean-up costs, expen-

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structure. Because of the actuarial uncertainty about environmental harms and because insurers have found it difficult to develop clear definitions for the scope of their policy coverage, insurers have sought to limit the coverage provided to polluters. *See* POLLUTION INSURANCE, *supra* note 136, at 68.

147. *Id.* at 75.

148. Worse still, having an insurance policy, whether issued by a public or a private underwriter, may create a moral hazard by discouraging a potential polluter from preventing pollution from occurring. *See* PERCIVAL ET AL., *supra* note 17, at 133 & fig. 2.4.

149. Rauner, *supra* note 108, at 161, 166-67.

150. Goodwillie & Alexander, *supra* note 122, at 240.

sive retro-fitting of the facility, or a shutdown in the event of a serious accident.[151] Second, environmental contamination or other environmental liability will jeopardize the lender's security interest in the project facility, which because of the limited-recourse nature of the financing, is the major part of the lender's security.[152] Further, conditions in the credit agreement will often specify that the established environmental standards of a particular nation or organization are met by the project.[153] For example, the credit agreement might require that the lender comply with the environmental laws of the United States or, more commonly, the environmental guidelines of the World Bank or another international finance agency.[154] Other conditions in the credit agreement may make initial financing and subsequent disbursements contingent upon the project company's obtaining an ongoing compliance with the necessary environmental permits and other documentation.[155]

In addition to contracts between the private parties involved in the transaction, there are typically contractual agreements between the host sovereign and the project entity that allocate environmental risk between those parties. The concession agreement is the primary agreement between the sovereign and the project entity.[156] This agreement defines the project's scope and establishes the project entity's rights and obligations with respect to the host government, including the range of national environmental legislation and regulations that govern the project.[157]

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151. *Id.* at 239.

152. *Id.*

153. E. Waide Warner, Jr. & Emily Altman, *Credit Agreements and Collateral Agreements in International Infrastructure Projects*, 734 PLI/Comm 233, 240 (1996).

154. GOODWILLIE, *supra* note 100, at 11-12.

155. Warner & Altman, *supra* note 153, at 238; Goodwillie & Alexander, *supra* note 122, at 240. Another example is the land conveyance agreement which is a type of contract usually used in projects involving a transfer to the project entity of the land on which the project is sited. Smith, *supra* note 94, at 227. The agreement usually makes a sale or a long-term lease of the land to the project entity. *Id.* Its terms allocate the "[r]esponsibilities for existing and future conditions at the site (suitability of soil conditions, environmental contamination, etc.)" and specify the "governing laws, regulations, and methods of dispute resolution." *Id.* Similarly, the sponsors and the operator/manager may enter into an agreement allocating some or all of the liability for environmental harms to the operator/manager because it is best situated to prevent the environmental harm from materializing.

156. Christopher J. Sozzi, Comment, *Project Finance and Facilitating Telecommunications Infrastructure Development in Newly-Industrializing Countries*, 12 SANTA CLARA COMPUTER & HIGH TECH. L.J. 435, 471 (1996).

157. *Id.* However, because the doctrine of sovereign immunity is sometimes invoked by a sovereign in order to excuse its breach of a contract, a means of protecting the reliance of the project sponsors and lenders is needed. Viktor Soloveytchik, *New Perspectives for Concession Agreements*, 16 HOUS. J. INT'L L. 261, 266 (1993). The stabilization clause is such a device. A stabilization clause is a term in an agreement between the project entity and the host sovereign which commits the host to apply consistently to the project the specific fiscal and regulatory requirements that were originally negotiated in that agreement. *Id.* While the consensus is that such clauses do not supersede the sovereign's right to terminate or modify a contract to which it is a party, some commentators argue for a more binding power to stabilization clauses. Thomas W. Waelde & George Ndi, *Stabilizing International Investment Commitments: International Law Versus*

Contractual agreements between the various parties internalize the environmental costs of the project and therefore can provide significant allocation and mitigation of environmental risk in project finance transactions. Contractual agreements assign responsibility for compliance with any applicable environmental standards and for assumption of the costs of any failure to comply with those standards. As a result of the parties' (particularly the lenders') due diligence process and of periodic, independent environmental auditing carried out in the course of the operation of the project, the project's network of contracts is a privately created framework into which provisions are incorporated directly to manage the environmental costs of the project and to assign the risk associated with those actual or potential costs.[158] This cost management is inherent in project finance because, as noted above, risk and cost identification and their allocation is central to the method of financing. The combination of a liability-imposed risk of environmental cost, combined with the cost-management function of project finance, bring the sophisticated professional expertise of lawyers, financiers, environmental and engineering experts to bear on the project facility's compliance with the environmental strictures imposed by the contractual framework.[159] As a result, there can be significant environmental protections conferred upon the developing nation by a transaction which is project financed rather than developed with more traditional debt-

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Contract Interpretation, 31 TEX. INT'L L.J. 215, 230 (1996). The risk of the host sovereign claiming sovereign immunity and breaching the agreement would be mitigated by such a clause which would be enforced in the event of a contractual dispute. *See* Sozzi, *supra* note 156, at 463. Such a clause, if effective, would protect the project entity from any changes in environmental law or regulation. Such a clause would also protect the project entity from the host's more vigorous enforcement of those rules that might result after the conclusion of the project agreements and the commitment of resources by the project company when the bargaining power shifts in favor of the host sovereign. While this type of stabilization may be favorable to the project company, in a rapidly changing legal environment, the better approach is probably to leave the host sovereign with unlimited regulatory options. Doing so would let the market regulate decisions to breach or modify by channeling capital away from those countries that abuse the sovereign power to dishonor contracts to the detriment of foreign project investors.

Another public-private contractual device which allocates environmental risk is a sovereign guarantee. The sovereign guarantee is an agreement that the host government will provide "compensation if future changes in government policy affect [the project's] viability." BOND & CARTER, *supra* note 91, at 3. *See also* WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 94 ("The continuing role of government lies in insuring the private investor against policy-induced risks."). These guarantees include assurance of compensation for events which would affect the regulatory posture of the host nation with respect to the degree and character of environmental compliance required of the project. *See* Smith, *supra* note 94, at 222.

158. *See supra* notes 149-50 and accompanying text.

159. *See* Goodwillie & Alexander, *supra* note 122, at 240. To mitigate environmental risk, Goodwillie and Alexander advise that:

> [a]t the planning stage [of the project], the parties should engage independent technical consultants to evaluate the environmental liabilities associated with the project, its location and its production materials and waste and with any pre-existing hazards on the site. Through advice of counsel, the parties should become familiar with the environmental laws of the host country . . . and assure that such laws are taken into account in the feasibility study phase.

financing.[160]

On paper, contractual allocation would appear to appropriately allocate environmental risk, but, in practice, a contractual framework alone is not enough to allocate the environmental risk of a developing nation effectively. First, developing countries rarely contract for provisions concerning environmental regulation. Many developing countries, as parties to sovereign guarantees or to concession agreements, lack sufficient legal and environmental expertise to incorporate the appropriate terms into their agreements. In those agreements between parties that do have the legal and environmental expertise (as between lenders and the project entity), the mechanisms for enforcing the terms are not in place. The host nation must both have the leverage to bargain for effective contractual provisions[161] and have effective national environmental legislation, regulation, and enforcement if contractual conditions are to effectively allocate responsibility for any harm to the environment. Second, the terms in the contract must be enforced if they are to be effective. The covenants in a financing agreement run between the lender and the project entity and the project entity is typically required to police itself to remain in compliance.[162] Self-policing has proven ineffective with respect to environmental compliance, particularly where no other environmental policing occurs.[163] Third, contractual allocation, even when effective, does not cover any of the transactions funded publicly, which, as noted above, are the vast majority of infrastructure projects undertaken in the developing world.[164]

Id.

160. The inclusion of explicit environmental standards in a project contract is an effective means of mitigating and allocating environmental risk and is often the most effective means of doing so if the host nation does not have developed or efficient environmental regulations and enforcement mechanisms. For example,

> [a] wastewater treatment contract in Mexico financed by IFC contains explicit contractual obligations for both the operator and the supplying utility . . . As before (when the local municipality treated waste water) government inspectors periodically check that the relevant national and local regulations are being enforced. However, the contract gives financial incentives for both the private operator and the municipal water authority to monitor standards continuously, because they determine payments made under the contract.

BOND & CARTER, *supra* note 91, at 34.

161. There is a dearth of technical and legal expertise in many developing nations which hampers the development of effective environmental rulemaking, whether at the individual contractual level or at the level of legislation. THE UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT, THE EFFECTIVENESS OF INTERNATIONAL ENVIRONMENTAL AGREEMENTS – A SURVEY OF EXISTING LEGAL INSTRUMENTS 24 (Peter H. Sand ed., 1992) [hereinafter U.N. CONFERENCE ON ENVIRONMENT].

162. BRAÑES, *supra* note 67, at 42.

163. *See id.*

164. *See* WORLD DEVELOPMENT REPORT 1992, *supra* note 13. Where a project is undertaken publicly, the only chance of appropriate allocation of environmental risk is if the nation has a functional system of environmental enforcement which also applies to the conduct of the sovereign. Otherwise, the public nature of the project will do nothing to benefit the environment and those who depend on it for their health and/or livelihood. *See* National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-4370 (1996) (requiring all federal agencies to consider the likely environmental effects of their activities).

If the choice of project entity and the agreement between the parties do not appropriately allocate environmental risk, perhaps it is because those mechanisms operate at the level of the individual transaction. A better means of allocating that risk is for an institution to set up rules that are applicable generally to all the transactions with which it is involved. In fact, because almost all project finance transactions utilize some sort of multilateral development bank (MDB) financing, the MDBs are in a position to, in effect, legislate rules allocating environmental risk. They have done so typically by requiring an environmental impact assessment (EIA) which effectively conditions their financing or loan guarantees upon assurances and projections that a project's design employs sufficiently clean technologies and is not sited anywhere that will have a tremendous environmental impact. The next question is whether the MDBs' rules are sufficient to render an appropriate allocation of environmental risk.

4. *Allocation by Means of the Environmental Assessment Criteria of an International Finance Institution or a National Export Agency*

Most project-financed transactions involve as a lender or as a guarantor of financing, or both, at least one international finance and development organization, such as the World Bank's subsidiary, the International Finance Corporation (IFC), or a national export finance institution such as the Export-Import Bank of the United States (Eximbank).[165] In the past decade, these public lenders have been under pressure to incorporate environmental assessment criteria into their project review procedures.[166] This pressure has come from environmental interest groups both in the developed nations and in the developing nations which host the projects.[167] As a result of these pressures, each institution has either adopted or co-opted a

165. *See* Mark Kantor, *Summary of Project Financing Programs of: U.S. Eximbank, OPIC, JEXIM, ECGD*, 707 PLI/Comm 111 (1995) (describing the project financing-related services offered by these institutions); Thomas N. Kerr, *What's Good for General Motors is Not Always Good for Developing Countries*, 29 INT'L LAW. 153, 154, 164-65 (1995); Rauner, *supra* note 108, at 157. For convenience, I will henceforth refer to these finance entities as "public lenders."

166. *See* Kerr, *supra* note 165, at 164. In fact, in 1996, Eximbank decided that it could not provide any financing to the Three Gorges Dam project participants because the project as presented to the bank did not meet the bank's environmental assessment guidelines, adopted in February, 1995. However, the bank did leave open the possibility that, upon a showing of further data, it could change its decision. *See* John H. Cushman, Jr., *Ex-Im Bank Refuses Loan Backing for Big China Dam*, N.Y. TIMES, May 31, 1996, at D1.

167. Generally, this adoption was prompted by political pressure that was the result of a number of cases where particular projects supported by public lenders had or could have had a severe detrimental effect on the environment. For example, in the United States, Eximbank felt intense political pressure to adopt formal environmental impact assessment criteria after it approved loan guarantees to fund the completion of a Soviet-designed nuclear reactor in Czechoslovakia shortly after the Cherynobyl disaster. Thomas W. Lippman, *Loan Guarantee Given for Czech Nuclear Plant; Westinghouse to Finish Soviet-Design Reactor*, WASH. POST, Mar. 11, 1994, at A20. Hearings on the "United States Export Import Bank and the Environment" before the House Subcommittee on International Development, Finance, Trade and Monetary Policy closely followed the grant of loan guarantees by Eximbank to Westinghouse, the contractor on the Czech

set procedures to evaluate the environmental impact of the projects they support.[168] The assessment procedures of public lenders typically allocate environmental risk by imposing performance standards for the life of the project. These standards are designed to minimize the environmental impact of the project and to impose any environmental costs upon the project entity.[169] To comply with the public lender's performance requirements, the project must be designed to internalize as much of its own potential environmental costs as is technologically feasible.[170]

To effectively regulate the environmental impact of projects they finance, public lenders apply extensive environmental assessment procedures to all projects seeking financing.[171] The Asian Development Bank's (ADB) procedures are typical of these environmental assessment procedures. Initially, the ADB's procedures require the Bank's project staff to categorize the project into one of three categories (A, B, and C) depending on the project's inherent tendency to pollute.[172] If the project is assigned to a category that will have substantial environmental impact (A or B), the Bank completes an initial environmental examination (IEE), and then an environmental impact assessment (EIA) if the IEE suggests the environ-

job. Eximbank promulgated new environmental guidelines in 1995. *See* Kerr, *supra* note 165, at 154.

168. Kerr, *supra* note 165, at 164-69. As an example of co-option, the International Finance Corporation has adopted the World Bank's environmental assessment guidelines as part of its environmental assessment procedures. INTERNATIONAL FINANCE CORPORATION, IFC AND THE ENVIRONMENT — ANNUAL REVIEW 1992, at 7 (1992). Typically,

> [t]he environmental review process involves consideration of the following, as appropriate: Assessment of the baseline environmental situation[;] Sustainable use of natural resources[;] Pollution controls (liquid effluents and air emissions) and solid and chemical waste management[;] Protection of human health, cultural properties, endangered species, and sensitive ecosystems[;] Use of dangerous substances[;] Major hazard assessment[;] Occupational health and safety[;] Fire and life safety[;] Resettlement issues[;] Socioeconomic concerns.

Id.

169. *See, e.g.*, WORLD BANK, ENVIRONMENTAL ASSESSMENT SOURCEBOOK 1-3 (1991) (providing waste level limits for over fifty industries).

170. *See* THE WORLD BANK, ENVIRONMENT DEPARTMENT, THE IMPACT OF ENVIRONMENTAL ASSESSMENT xviii & n.4 (1997) [hereinafter IMPACT OF ENVIRONMENTAL ASSESSMENT]; ASIAN DEVELOPMENT BANK, ENVIRONMENTAL RISK ASSESSMENT: DEALING WITH UNCERTAINTY IN ENVIRONMENTAL IMPACT ASSESSMENT 9-12 (1991) [hereinafter ENVIRONMENTAL RISK ASSESSMENT].

171. Kerr, *supra* note 165, at 154.

172. ASIAN DEVELOPMENT BANK, ENVIRONMENTAL ASSESSMENT REQUIREMENTS AND ENVIRONMENTAL REVIEW PROCEDURES OF THE ASIAN DEVELOPMENT BANK 3 (1993). The three categories are as follows:

> Category A: Projects with significant adverse environmental impact as predicted by the IEE [environmental examination]; an EIA [environmental impact assessment] is required. Category B: Projects with adverse environmental impact but which are of lesser degree and/or significance than category A impact; although an EIA may not be required, an IEE is required for these projects. Category C: Projects unlikely to have adverse environmental impact; no EIA or IEE is normally required.

Id. at 3. The World Bank, which initially categorizes projects in a similar fashion as the Asian Development Bank, provides lists of which types of projects typically fall into each category. *Operational Directive 4.00, Annex A3, in* 1 ENVIRONMENTAL ASSESSMENT SOURCEBOOK, *supra* note 13, at 37.

mental impact will be of a sufficiently serious nature.[173] The latter document includes the following sections: a general description of the project; a description of the environment in which the project is to take place; the anticipated environmental impacts of the project and mitigation measures that will be taken by the project company; several alternatives to the project as planned and the relative environmental impact of those alternatives; a cost benefit analysis of the project; the institutional requirements and environmental monitoring requirements for ongoing compliance; a representation of the steps taken to secure significant public involvement in the assessment process; and a section for the conclusions of the EIA report.[174]

Public lender assessment criteria regulate the project's impact upon the host nation's environment by requiring the project entity to mitigate potential environmental harms. In nations that lack an effective regulatory mechanism, public lender environmental assessment criteria are often the main or only form of environmental regulation of project financed infrastructure facilities.[175]

While these criteria impose a minimum level of concern for the environmental impact of a funded project, public lender regulatory mechanisms are insufficient on their own to effectively regulate the environmental impact of project financed infrastructure development. First, public lenders' regulatory authority reaches only those projects that are funded by the lender; they cannot regulate foreign investment projects that do not involve a public lender, nor can they reach public or private domestic projects which typically do not involve such a lender. As noted above, these latter two categories account for the vast majority of infrastructure projects.[176] While private foreign funds are increasing as a percentage of total infrastructure investment in developing countries, public domestic funds still make up over ninety percent of total infrastructure investment.[177] Second, public lenders' assessment guidelines are not enforceable in the international legal system so that there is no legal accountability to deter breaches of those guidelines, nor any available legal redress based on the guidelines if breaches lead to harms.[178] Third, the development of domestic and global capital markets sparked by the

173. ASIAN DEVELOPMENT BANK, *supra* note 172, at 1.

174. *Id.* at 31-37.

175. This surrogate function is illustrated by the International Finance Corporation's use of "the more stringent of the host country's requirements or World Bank policies and guidelines." INTERNATIONAL FINANCE CORPORATION, *supra* note 168, at 6.

176. *See supra* note 90 and accompanying text.

177. WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 89-90.

> Developing countries now spend around $200 billion a year on infrastructure investment, some 90 percent or more of it derived from government tax revenues or intermediated by governments . . . Infrastructure's share of total government investment is rarely less than 30 percent and sometimes as much as 70 percent . . . In addition, maintenance and operating expenditures command a high share of current expenditures.

Id.

178. This is because MDBs do not have formal legal standing before international courts. Guyett, *supra* note 69, at 895.

increased flow of private investment for infrastructure in developing nations decreases the number of projects that involve public lenders.[179] Therefore, public lenders' environmental assessment criteria regulates an increasingly smaller percentage of infrastructure projects in developing nations.[180] Additionally, public lenders' environmental impact assessment is often carried out by the resource-strapped host nations themselves.[181] One of the implications of this is that a relatively technically unsophisticated nation is responsible for making a very sophisticated technical evaluation, a situation which may well result in a faulty evaluation. Also, MDB environmental impact assessment typically requires monitoring for ongoing compliance during the construction and operation of the facility. Thus, the host nation must have a developed regulatory mechanism in place to enforce effectively the MDB environmental assessment guidelines.[182]

For these reasons, MDB assessment guidelines do not provide sufficient allocation of environmental risk. Therefore, they cannot sufficiently prevent environmental harms from occurring, nor can they ensure that the costs of those occurrences are accounted for by the polluter. While these quasi-legislative rulemakers cannot provide developing nations with sufficient environmental protection from the environmental consequences of infrastructure development, perhaps actual legislatures could so provide. The next two sections look at the potential for allocation of environmental risk by means of public law: international and national.

5. *Allocation by Means of International Law*

Since the 1972 Stockholm Declaration, the international community, as represented by the United Nations, has demonstrated a commitment to protecting the natural environment.[183] In the period between Stockholm and the present, over 160 multilateral treaties and protocols on the environment have been promulgated.[184] Despite this multitude of agreements, they have been largely ineffective because few of them contain substantive commitments by the parties and the agreements generally lack monitoring and enforcement mechanisms.

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179. WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 104.

180. Goodwillie & Alexander, *supra* note 122, at 239.

181. Charles E. Di Leva, *The World Bank And Environmental Law: A Post Rio Summary of Activities*, C883 ALI-ABA 525, 529 (1994). While MDBs have some policing mechanisms, they are limited and should not be considered a substitute for national policing. This limitation is evident in the tremendous local regulatory and administrative capacity-building efforts of these MDBs which indicate that their policing capacity is not a sufficient substitute for national monitoring. *See id.* at 525.

182. BRAÑES, *supra* note 67, at 42.

183. REPORT OF THE U.N. CONFERENCE ON THE HUMAN ENVIRONMENT, STOCKHOLM DECLARATION OF THE UNITED NATIONS CONFERENCE ON THE HUMAN ENVIRONMENT, 27th Sess., U.N. Doc. A/Conf.48/14 (1972).

184. *See* U.N. ENVIRONMENT PROGRAMME, REGISTER OF INTERNATIONAL TREATIES AND OTHER AGREEMENTS IN THE FIELD OF THE ENVIRONMENT, U.N. Doc. UNEP/GC15/INF4 (1993).

International rulemaking and non-binding international agreements on regulating the global environment are playing a greater role in the allocation of environmental risk in international project finance transactions.[185] Even though there are as yet no globally binding international legal rules on the environment,[186] recent international agreements are pregnant with implications for the future of environmental regulation at the regional and global level.[187] While developing nations tend to embrace international environmental legal norms reluctantly, if at all,[188] recent international initiatives in the areas of air quality, water quality, management of waste, management of hazardous products, and protection of flora and fauna will affect the conduct of project companies engaged in the construction and operation of infrastructure and industrial facilities in developing nations in the years to come.[189]

The 1992 United Nations Conference on the Environment and Development (UNCED) held in Rio De Janeiro, Brazil sought to establish a new world consensus on the relationship between development and the environment.[190] The dominant feature of this consensus is its guiding principle, embracing "sustainable development" and the ideal of a "marriage of environment and development."[191] The specific conventions and the several agreements concluded at UNCED serve, respectively, as binding legal rules and as the framework for the development of future binding legal rules at the national level.[192] These legal rules, instead of reflecting the traditional paradigm of mutual exclusivity of development and environmental protection,[193] demand that development occur only with due

185. *Id.* at xi. "In the period [since] 1940 . . . over one hundred international agreements and legal instruments regulating the environment have been made law." Mary Pat Williams Silveira, *The Rio Process: Marriage of Environment and Development, in* SUSTAINABLE DEVELOPMENT AND INTERNATIONAL LAW 9-10 (Winifred Lang ed., 1995).

186. TRANSNATIONAL CORPORATIONS AND MANAGEMENT DIVISION, UNITED NATIONS, INTERNATIONAL ENVIRONMENTAL LAW — EMERGING TRENDS AND IMPLICATIONS FOR TRANSNATIONAL CORPORATIONS 1 (1993) [hereinafter INTERNATIONAL ENVIRONMENTAL LAW].

187. *Id.* at 2. Additionally, there has been a proliferation of bilateral, multilateral and regional treaties binding two or more signatories to legal norms designed to protect the environment. NANDA, *supra* note 26, at 7.

188. Silveira, *supra* note 185, at 11.

189. *See* INTERNATIONAL ENVIRONMENTAL LAW, *supra* note 186, at 3-9.

190. *See* Rio Declaration, *supra* note 81, at 876.

191. Silveira, *supra* note 185, at 10.

192. Two items of international law were opened for signature at (UNCED): a Framework Convention on Climate Change which is aimed at stabilizing global emissions of greenhouse gas, and a Biodiversity Treaty aimed at protecting endangered species. The non-binding agreements concluded were the Rio Declaration on Environment and Development, the Statement of Forest Principles, and Agenda 21. Rio Declaration, *supra* note 81, princ. 7; Statement of Forest Principles, UNCED Doc. A/Conf.151/6/Rev.1, 13 June 1992, *reprinted in* 31 I.L.M. 881 (1992); *United Nations Conference on the Environment and Development*, Agenda 21, U.N. Doc. A/CONF.151/PC/100/Add.1 (1993) [hereinafter Agenda 21].

193. The traditional view, prevalent today particularly in developing nations, holds that "[e]conomic growth [should] overshadow [concerns about the environment,] following the example of the industrialized countries that began to tackle their environmental problems only after achieving major economic objectives." ISMAEL SERAGELDIN ET AL., THE WORLD BANK, MAKING DEVELOPMENT SUSTAINABLE 13 (1994).

accounting for its effects on the global environment.[194] These new and developing international rules typically allocate the environmental risk of infrastructure development to the project company. Then, the project company, for example, passes along any additional costs to the public in the pricing of the service it provides.[195]

There are at least two major obstacles to the formation of a globally binding regime of international environmental law that effectively allocates environmental risk. First, strong forces of sovereignty and self-determination pull developing nations away from integration with an international order.[196] This means that many international agreements are not ratified by individual developing nations and thus are not binding upon them.[197] As noted above, many developing nations are skeptical about whether ratification would bind them to a new world order that best serves their interest in efficiently developing their economies.[198] The threat of additional costs, added to the already tremendous costs of developing an infrastructure and industry, has caused many developing nations to perceive the sustainable development model as an impediment to economic growth.[199] Consequently, they have not incorporated sustainability into their environmental management planning.[200] Furthermore, Principle 23 of the 1972 Stockholm Declaration on the Human Environment articulates the need to consider "the system of values prevailing in each country, and the extent to which the applicability of standards which are valid for the most advanced

194. CENTER FOR INTERNATIONAL LEGAL STUDIES, INTERNATIONAL ENVIRONMENTAL LAW AND REGULATIONS 251 (Dennis Campbell ed., 1996) ("[P]olicy makers internationally are considering the use of prior compensatory remedies to persuade industry to act more responsibly and to shoulder the full cost of its environmental impact.").

195. The "polluter-pays principle" is an integral element of the new environmental consensus. INTERNATIONAL ENVIRONMENTAL LAW, *supra* note 186, at 25. The principle ensures that "natural or legal persons governed by public or private law who are responsible for pollution must pay the costs of such measures as are necessary to eliminate that pollution or to reduce it so as to comply with the standard or equivalent measures." *Id.* The European Economic Community (EEC) recommends that member states apply the principle in their national environmental legislation and has also incorporated the principle into the 1987 Amendments to the Treaty of Rome. *Id.*

196. *See* UNITED NATIONS ENVIRONMENT PROGRAM, 1992 ANNUAL REPORT OF THE EXECUTIVE DIRECTOR — TWENTY YEARS SINCE STOCKHOLM 1 (1992) [hereinafter TWENTY YEARS]; NANDA, *supra* note 26, at 10-11.

197. NANDA, *supra* note 26, at 10-11; FREDERIC L. KIRGIS, JR., INTERNATIONAL ORGANIZATIONS IN THEIR LEGAL SETTING 280 (2d ed. 1993).

198. *See Developments in the Law — International Environmental Law, IV, Assent to and Enforcement of International Environmental Agreements*, 104 HARV. L. REV. 1550, 1550-51 (1991) ("states may underestimate environmental problems and conclude that negotiating or assenting to agreements is too costly.").

199. NANDA, *supra* note 26, at 10-11.

200. A related idea is held by many decision makers in developing nations. Since the "right" to externalize the costs of pollution is a form of entitlement that was used by the now-developed nations, these decision makers in the developing nations believe that now that "right" should be available to them to "subsidize" their development. This perceived inequity has given rise to the concept, included in the Rio Declaration in 1992, that "in view of the different contributions to global environmental degradation, States have common but differentiated responsibilities." Rio Declaration, *supra* note 81, princ. 7.

countries may be inappropriate and of unwarranted social cost for the developing countries."[201] This principle is the basis for the conclusion that developed nations have a responsibility to share in any additional costs incurred by developing nations if they choose to develop their infrastructure, industry, and natural resources sustainably, rather than in a manner which is cheaper because it externalizes some or all environmental costs. However, these nations instead opt for exploitation of natural resources in accordance with the traditional development model and their sovereign right to exploit resources within their national boundaries or under their control.[202] Further, because international agreements must be ratified by individual nations in order to become binding upon those nations, there is nothing to compel these nations to join the new international environmental order.[203]

Second, even when these nations wish to participate in an international agreement effectively allocating environmental risk, they often lack sufficient legal, technical, and administrative capacity to effectively implement and enforce such international environmental regimes.[204] The inter-

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201. Developed nations have set up several multilateral funds to pay the difference in cost between the less and more environment-friendly technologies. The Global Environment Fund (GEF) is a good example:

> [t]he GEF provides funding only for the 'agreed incremental costs for achieving agreed global environmental benefits.' This means that financing will be devoted only to those activities that benefit the global, as opposed to local, environment, and will only fund the costs of actions which, because benefits accrue globally and not locally, recipient countries would not undertake in their own interest.

Proposed Operations and Structure of a Permanent Global Environment Facility: Hearing Before the Subcomm. on International Development, Finance, Trade, and Monetary Policy of the Comm. on Banking, Finance, and Urban Affairs – House of Representatives, 103d Cong., Serial No. 103-60, 35 (1995) (Statement by Susan Levine, Deputy Assistant Secretary for International Development, Debt and Environment Policy, Treasury Department).

202. This right has consistently been acknowledged in international legal instruments and by legal scholars.

> Principle 21 of the Stockholm Declaration on the Human Environment begins, 'States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies.' The Rio Declaration on Environment and Development repeats this statement in Principle 2, and adds 'and developmental' to [environmental policies]. The Stockholm principle has been commonly regarded as reflecting customary international law, and hence binding on all states.

Edith Brown Weiss, *Environmental Equity: The Imperative for the Twenty-First Century, in* SUSTAINABLE DEVELOPMENT AND INTERNATIONAL LAW, 18, n.3 (Winifred Lang ed., 1994).

203. CENTER FOR INTERNATIONAL LEGAL STUDIES, *supra* note 192, at xxvi ("The proliferation of international regulations on various aspects of the environment has not always been reflected in national ratification."). There are, however, pressures that can be brought to bear on recalcitrant nations, such as political pressure or economic pressures, such as trade sanctions or limitations on foreign aid.

204. U.N. CONFERENCE ON ENVIRONMENT, *supra* note 161, at 24. In this survey of the implementation of international law in individual nations, the editor, a leading commentator in the field of international environmental law, observes that:

> While there is a continuous need for law improvement in all countries, many developing countries have been affected by shortcomings of laws and regula-

national community also lacks a mechanism to effectively enforce these international agreements.[205] Therefore, absent effective national legal and administrative systems, international legal norms do not have a real effect in individual developing nations.[206]

Environmental management is a local, decentralized form of regulation because it addresses the physical conditions in, or emanating from, particular locations.[207] Despite the ascendancy of international environmental law, it is insufficient to regulate the environment of developing nations without well-developed national legislation, regulation and enforcement. Thus, effective national laws and law enforcement are needed. In fact, absent effective national environmental regulation through both international law and contractual agreement, multilateral development institutional criteria will not effectively allocate the environmental risk and costs to the environment caused by the development of infrastructure and industry. National regulation is not only the most valuable means of allocating environmental risk but is necessary to the effectiveness of the other means

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> tions. To effectively integrate environment and development in the policies and practices of each country, it is essential to develop and implement integrated, enforceable, effective laws and regulations . . . . It is equally critical to develop workable programmes to review and enforce compliance with the laws, regulations, and standards that are adopted. Technical support may be needed for many countries to accomplish these goals. Technical cooperation requirements in this field include legal information, advisory services, and specialized training and institutional capacity-building.

Id. Jutta Brunee, *Environmental Security in the Twenty-First Century: New Momentum for the Development of International Environmental Law?*, 18 FORDHAM INT'L L.J. 1742, 1745 (1995); Silveira, *supra* note 185, at 11 ("The lack of appropriate institutional and organizational capacity [in developing nations] may pose formidable obstacles [to implementation of international legal norms].").

205. David Ardia has pointed out that "[t]he lack of a 'centralized supranational regulatory authority' has been cited as the critical barrier to effective environmental protection." Ardia, *supra* note 16, at 544 & n.237 (quoting *Developments in the Law – International Environmental Law, V, Institutional Arrangements*, 104 HARV. L. REV. 1580, 1590 (1991)).

206. *See Developments in the Law*, *supra* note 198, at 1487, 1609 ("The body of customary norms and international agreements that comprise the public international legal system do not provide comprehensive environmental protection."); Sanford E. Gaines, *Global and Regional Perspectives on International Environmental Protection*, 19 HOUS. J. INT'L L. 983, 997-98 (1997) *cited in* Ardia, *supra* note 16, at 509 n.58. ("With weak international administrative capacity, the effectiveness of the regime depends on the capacity of each of the participating governments to implement and enforce the appropriate domestic measures to give effect to the agreement.")

207. *See* BRAÑES, *supra* note 67, at 54; Cairncross, *supra* note 31, at 40 (concluding that "[u]ltimately, local environmental problems that harm health or economic productivity will be solved by local pressures."). However, many scholars argue that the salient characteristic of environmental problems is that they are not local. *See, e.g.*, Ardia, *supra* note 16, at 501 n.20 (identifying the following two lines of argument: 1) environmental issues are not local because of the "interconnectedness of the biosphere;" and 2) environmental issues cannot be local because of the "interconnectedness of global commerce.") These scholars mistake cause and effect. The causes of environmental degradation are local, the effects are, or can be, international. The primary goal of environmental regulation should be to police causes, not effects. Therefore, environmental regulation is best arranged as a more locally-focused practice.

of risk allocation.[208] National regulation, therefore, is best conceived of as the keystone of a system of environmental management which includes the variety of means discussed in the preceding sections. The next Part considers national environmental laws and enforcement mechanisms.

III. The Need for and Means of Promoting National Environmental Regulatory Infrastructures

The preceding Part discussed allocation of environmental costs in a particular type of transaction, project finance. As noted above, project finance, as increasingly common means of constructing massive infrastructure projects, serves as a useful case study to determine the best means of allocating environmental risks and costs imposed by the economic development of the developing world.[209] Given the close analogy between project finance and large scale development in general, the conclusion that national environmental regulation is the best way to allocate environmental risk in international project finance transactions indicates that national regulation is also the best way to regulate the environmental degradation caused by development of the physical infrastructure of developing nations generally.[210]

National environmental regulation in the developing nations has consistently expanded and developed over the past several decades.[211] Presumably, this is because those nations view national regulation as an effective means of shifting environmental costs. Among developing nations, however, there is wide variation in the enforcement of existing laws[212] as well as in the extent and quality of environmental rule mak-

208. Silveira, *supra* note 185, at 10 ("International agreements are ratified by states, and compliance is the responsibility of states. Meaning is derived from international agreements only as each state fulfills its obligations to translate international law into national legislation, regulation and institutions."); BRAÑES, *supra* note 67, at 34-35; WORLD DEVELOPMENT REPORT 1994, *supra* note 2, at 82. This relationship is exemplified by the fact that there are ongoing "changes in government regulations [for protecting the environment] which . . . are pushing many private companies to go further than the [existing] minimum legal standards." BOND & CARTER, *supra* note 91, at xii. Unfortunately, this regulatory capacity will not be built up overnight. A national scheme must sometimes reflect a measure of flexibility, to accommodate the variety of national economic needs, and harmony, so that commercial interests are better served.

209. *See supra* notes 18-24 and accompanying text.

210. This assertion does not mean that the other means examined here do not have a place in the allocative process. In fact, as we have seen, contract and international law, as well as the assessment criteria of public lenders, are valuable tools. These means, however, are insufficient by themselves and require a national system to be sufficiently effective.

211. *See* BAKER & MCKENZIE, ENVIRONMENTAL LAW AND POLICY IN LATIN AMERICA 1-2 (Osvaldo R.I. Agatiello ed., 1995). *See also supra* note 88 and accompanying text.

212. *See* Goodwillie et al., *supra* note 24, at 9. Goodwillie divides states into three tiers:

> In this regard, nations can be classed in approximately three levels of progressively lower administrative regulation: (1) The United States, the nations of Western Europe, Canada, Japan, and Australia (highly regulated); (2) Administratively centralized and developing countries, e.g. Venezuela, Turkey, Indonesia, and former Eastern Bloc countries (significant regulation; frequently overlap-

ing.[213] Most developing nations still do not effectively manage their natural environments either because their environmental laws and regulations are insufficiently defined or, if the laws *are* sufficiently defined, because of insufficient enforcement.[214] The following sections explore how national environmental regulatory infrastructures are formed, what characteristics such systems should have, and how the formation of such systems in developing nations can be promoted.

A. The Stages of Development of Regulation

Environmental regulation, like most laws, originates from concern about a public problem. Strong concern for the environment has only appeared during the last three decades, first in developed nations and more recently in developing nations.[215] In developing nations, environmental activism has manifested itself in both national popular political movements[216] and in the formation of non-governmental organizations (NGOs).[217] Both of

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ping because of very large public sector); (3) relatively poor developing nations, e.g. Sub-Saharan Africa (little regulation and typically very highly centralized). *Id.* *See also* Silveira, *supra* note 185, at 11.

213. The emphasis on national legislation as the best means of allocating environmental risk is not incompatible with harmonization of national laws. Developing nations should be encouraged to harmonize their laws as much as possible and should be subject to international legal minimums so that gross environmental harms are legally barred. However, developing nations should be permitted to develop independent systems that take into account their development needs even if higher environmental costs are incurred. Perhaps a set of global standards could be gradually phased in to mitigate the harm to the environment caused by laggard, grossly polluting nations.

214. From the perspective of the host developing nation, "[t]he key components of environmental management are policy, law and administration." BRAÑES, *supra* note 67, at 5. The environmental legislation in many developing nations is inadequate to meet the task of effective environmental protection. *Id.* Even where there is legislation on the books, often it is ineffective because adequate regulations are not promulgated, technical standards are not established, and sufficient administrative capacity is neither allocated nor funded. *Id.* at 35, 70-71.

215. *See, e.g.*, HAMMER & SHETTY, *supra* note 13, at 3; TWENTY YEARS, *supra* note 196, at 1.

216. *See* GREG BANKOFF, CHANGING PERCEPTIONS OF THE ENVIRONMENT: STATE AND SOCIETY IN MARITIME SOUTHEAST ASIA 14 (1993). Bankoff observes that, in Southeast Asian nations:

> [t]he state is now subject to pressure from a new source, one that has historically exerted a negligible influence on policy. [In maritime Southeast Asia,] [p]ublic opinion, both domestic and international, has found a voice . . . . The environmental concerns of an increasingly literate and better informed public opinion is having an effect on restraining government policies that favour the non-sustainable exploitation of the natural resources within their national boundaries.

Id. Public consciousness of environmental issues has grown in Latin America as well. *See, e.g., Peru, Environmental Concern Grows,* National Trade Data Bank Market Reports, Oct. 5, 1995, at para. 1; *Argentina – Environmental Technologies*, NATIONAL TRADE DATA BANK MARKET REPORTS, July 16, 1996, at 1.

217. Scholars have identified several of the functions of NGOs that are consistent with such a role. These functions include: *intelligence* or "the gathering, analysis, and dissemination of information relevant to decisionmaking;" *promotion*, or the "advocacy of policy alternatives to authoritative decisionmakers either directly or indirectly through a broader public;" and *prescription*, or the designation of policies, namely

these phenomena play a large part in the formation of national regulatory systems.[218] Further, the emerging environmental consciousness manifest in these two phenomena is usually the motivating force that prompts nations to move from the pre-environmental stage through the three "stages of choice,"[219] outlined below.

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rulemaking. Steve Charnovitz, *Two Centuries of Participation: NGOs and International Governance*, 18 MICH. J. INT'L LAW 183, 271-72 (1997). *See also* James Cameron, *Compliance, Citizens, and NGOs, in* IMPROVING COMPLIANCE WITH INTERNATIONAL ENVIRONMENTAL LAW 29 (James Cameron et al. eds., 1996) (calling NGOs "increasingly important non-state manifestation[s] of collective expression of individual will and aspiration"). The important role which NGOs play in environmental politics is indicated by Chapter 27 of Agenda 21 which begins by stating that NGOs "play a vital role in the shaping and implementation of participatory democracy." Agenda 21, *supra* note 192, ch. 27.

218. Effective national environmental policy is most likely to be implemented if there is a nexus between the popular will (whether expressed directly or through NGOs), on the one hand, and government institutions on the other. Chapter 27 of Agenda 21 recognizes this nexus and states that "to ensure that the full potential contribution of non-governmental organizations is realized, the fullest possible communication and cooperation between international organizations, national, and local governments and non-governmental organizations should be promoted." *See* Agenda 21, *supra* note 192, ch. 27.

219. The economists Mercuro and Ryan use this term for their model of environmental public policy formation. The first of the three "stages of choice" is the "constitutional stage of choice" during which the members of a society "seek to spell out the behavioral limits of what is and what is not mutually acceptable conduct and lay out the so-called *rules for making rules*." NICHOLAS MERCURO ET AL., ECOLOGY, LAW AND ECONOMICS: THE SIMPLE ANALYTICS OF NATURAL RESOURCE AND ENVIRONMENTAL ECONOMICS 78-80 (1994). The constitution forms the basic mold in which the regulatory institutions are cast, and establishes a legal basis for the regulation of the environment. Many developing nations have recently included rules for making environmental provisions in their fundamental charters. E. Brandl & H. Brungert, *Constitutional Entrenchment of Environmental Protection: A Comparative Analysis of Experiences Abroad*, 16 HARV. ENV. L. REV. 1, 4 (1992) (stating that "[e]nvironmental values or rights may be constitutionalized under two general approaches: explicitly, by passing constitutional amendments, or implicitly, by interpreting existing constitutional language to provide environmental protections"). This incorporation of environmental concerns into a nation's foundational document deeply roots regulation of the environment in that nation's political, social, and administrative structures and demonstrates the political power of the movement to regulate environmental harms. Brandl and Brungert further argue that:

> [c]onstitutional implementation enables environmental protection to achieve the highest rank among legal norms, a level at which a given value trumps every statute, administrative rule, or court decision. . . . In addition, addressing environmental concerns at the constitutional level means that environmental protection need not depend on narrow majorities in legislative bodies. Rather, environmental protection is more firmly rooted in the legal order because constitutional provisions ordinarily may be altered only pursuant to elaborate procedures by a special majority, if at all.

Id. at 14.

The next stage identified by Mercuro and Ryan is the "institutional stage of choice," during which the functional rules for the management of conduct affecting the environment are formulated. MERCURO ET AL., *supra*, at 80. This stage "focuses directly on the structure of the political/legal institutions (more commonly referred to as *the State*) as well as the revision of those institutional structures. . . . It is the specific *working rules* — the complex set of rules that give rise to the institutional decision-making processes. . . ." *Id.* This stage typically creates, or incorporates from parallel regulatory schemes, a complex system of legislative, administrative, judicial and civilian decision makers. *Id.* It is often an open system in which the working rules are shaped and reshaped over time in response to new information and shifting political pressures. *Id.* By effectively creating

Typically, nations begin in the "pre-environmental stage," where there is little or no environmental regulation, and little or no consciousness of environmental issues. The only "environmental law" is a body of common law, for example, nuisance law, water rights, or uncollected statutes that unsystematically address other specific environmental problems.[220] These rules largely protect private property rights and cases are brought by individual claimants. The rules do not provide for enforcement by an agent of the state such as an administrative agency.[221]

Against this legal backdrop, growing public consciousness of the consequences of unregulated development, human settlement, and exploitation of resources prompts the initiation, expansion, and revision of regulatory systems.[222] For many nations, this process begins with constitutional action. They revise or reinterpret their constitutions, effectively rooting environmental concern in the fundamental charter of the nation.[223] Subsequent to this constitutional revision, institutional choices are made, usually in the form of a broad legislative mandate which may do

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incentives, this stage seeks to, "correctly channel behavior so as to enable a society to internalize environmental externalities. . . ." *Id.* at 81.

The third stage of choice is the "economic impact stage of choice." *Id.* at 80. This stage of choice is predicated on the idea that "there are three distinct property right systems for organizing and controlling the allocation of society's scarce resources: the market sector, the public sector, and the communal sector." *Id.* at 81. In a pure market sector, each individual owns more or less rights to use goods and resources. *Id.* These rights in a perfect market sector will be completely specified – *i.e.* clearly delineated, exclusive, transferable, enforceable – and enforced. *Id.* In such a system, individuals will specialize and trade their rights to optimize their well being. *Id.* In a perfect public sector, however, all resources are allocated and distributed by the State in the form of status rights, rights to claim a particular quantity and quality of resources. *Id.* These rights are non-transferable and are conferred at the discretion of the state's government. *Id.* In the communal sector, the individuals in the society decide what resources will be owned by and be available to all equally. These rights would therefore be non-exclusive and so non-transferable. *Id.* Instead of being distinct systems of resource allocation, however, "typically, all three systems operate contemporaneously to allocate resources." *Id.* In a modern society, members of that society:

> in attempting to promote economic growth and development as well as fostering actions to enhance and protect their environment and natural resources, will act both individually and collectively to revise the constitution, to structure and restructure the institutional working rules, and to alter the property rights (be they private, status, or communal) in the market, public or communal sectors in order to achieve an allocation of resources that will enhance their individual welfare.

Id. at 83. In fact, this model provides an accurate account of the formation of environmental regulation in particular developing nations.

220. *See* PERCIVAL ET AL., *supra* note 17, at 72.

221. *Id.* at 133, fig. 2.4.

222. *See, e.g.*, PERCIVAL ET AL., *supra* note 17, at 4-6 (describing this process in the United States).

223. There are many examples of the recent "constitutionalization" of environmental law in developing nations. *See, e.g.*, ARG. CONST. art. 41 (1994) (Argentina); COLUM. CONST. arts. 78-82 (1991) (Colombia); CONGO CONST. art. 46 (1992); USTAVA CR art. 35 (1992) (Czechoslovakia); INDIA CONST. (as amended to the 78th Amendment Act, 1995) art. 48A (article 48A was a part of the Forty Second Amendment Act of 1976); COSTA RICA CONST. art. 50 (as amended by Law 7412, June 3, 1994); POLAND CONST. art. 74 (1997); REP. KOREA CONST. art. 35 (1987).

any or all of the following: address natural resource protection, environmental management, and pollution control;[224] establish an environmental administrative agency that is either independent or is a part of another existing agency;[225] grant that agency authority to promulgate and enforce implementing regulations;[226] and/or consolidate any existing law of environmental protection and planning in a single comprehensive statute.[227]

The third, or economic, stage of choice follows this legislative stage. During this third stage, the nation utilizes the market, public, or communal sectors to regulate environmental harm.[228] Typically, nations develop administrative regulations, which are promulgated and enforced by an environmental regulatory apparatus that either employs market incentives or allocates particular status rights to apportion environmental rights and resources.[229]

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224. A list of such areas of regulation might include: protection of air quality; protection of water; protection of natural resources; protection of wildlife; regulation of hazardous substances including chemicals; land use planning; agricultural regulation; energy regulation; protection of cultural resources; and noise regulation. *See* Brian J. Nickerson, *The Environmental Laws of Zimbabwe: A Unique Approach to Management of the Environment*, 14 B.C. THIRD WORLD L.J. 189, 228 (1994).

Examples of such statutes include: National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-4370 (1994) (United States); Pakistan Environmental Protection Ordinance No. XXXVII of 1983, XXI Pakistan Code 109 (preamble); Environmental Protection Law of the People's Republic of China, chs. I, II & III (1979); Federal Law of Prevention and Control of Environmental Contamination (1971) (Mexico); Environmental Quality Act of 1974 (Malaysia), *in* GREG BANKOFF & KYLIE ELSTON, ENVIRONMENTAL REGULATION IN MALAYSIA AND SINGAPORE 18-21, 25-33 (1994); Environmental Protection Act (1991) (S. Korea).

225. *See, e.g.*, Decree 177, 2/24/92, B.O. 1/30/92 (creating Argentinean Secretariat of National Resources and Human Environment); Pakistan Environmental Ordinance No. XXXVII of 1983, *supra* note 224, § 5; Organic Law of the Environment, Official Gazette No. 31,004 of 16 June 1976, art. 14 (Venezuela); The Enhancement and Conservation of National Environmental Quality Act, BE 2535, § 3 (1992) (Thailand); General Law of Ecological Equilibrium and Environmental Protection (1988) (Mexico).

226. *See, e.g.*, Lester Ross, *The Environmental Dimension of Trade and Investment*, *in* TAIWAN TRADE AND INVESTMENT LAW 625 n.31 (Mitchell A. Silk ed., 1994) (discussing Taiwan's creation of an administrative agency to regulate the environment); BANKOFF & ELSTON, *supra* note 224 (discussing the Environmental Public Health Act 1974 (Singapore)); Criminal Law of the Environment (Official Gazette No. 4,358 Extraordinary of 5 December 1991) (Venezuela); Environmental Protection Law of the People's Republic of China, *supra* note 224, ch. IV.

227. *See, e.g.*, S.K. CHOUDHURI, ENVIRONMENTAL LEGISLATION IN INDIA 6-76 (1996) (summarizing the Environment Protection Act, 1986, No. 29 of 1986, § 1, 1 (1986) (India)); 1994 Environmental Framework Law, No. 19,300 (Chile); General Law of Ecological Equilibrium and Protection of the Environment (1988) (Mexico); Federal Law No. 6,938 (8/31/81) (Brazil); BANKOFF & ELSTON, *supra* note 224, at 13 (discussing Malaysia's adoption of an integrated approach to the environment with its Environmental Quality Act of 1974).

228. *See* MERCURO ET AL., *supra* note 219, at 81-86.

229. Environmental legislation and regulation in developing nations is often modeled on the established laws and administrative mechanisms of developed nations. Administrator William K. Reilly of the U.S. Environmental Protection Agency noted: "[t]o an extraordinary degree, the world looks to EPA to chart the course of environmental protection. What we do here is watched closely and borrowed almost immediately." *A Vision for EPA's Future: An Interview With William K. Reilly*, EPA J., Sept-Oct. 1990, at 6.

Subsequently, nations make further institutional choices, often after a great deal of time and political effort, and enact more particular additional environmental legislation, thus creating a more comprehensive regulatory and planning system of environmental rights and responsibilities.[230] Typically, nations implement such legislation using the existing administrative structure. The approach, however, may make a different economic choice by allocating rights by different means so that the market, public, or communal sectors each carry more or less of the burden of regulation.[231]

B. Factors That Affect the Development of NERIs in Developing Nations

Though it provides a useful overview of what the progression of environmental regulation in developing nations consists of, this "stages of choice" analysis tells us little about which particular factors influence that progression through the three stages. This section discusses some of the factors that cause or promote the development of national environmental regulatory infrastructures in developing nations.

1. Public Will

Development of a comprehensive environmental regulation system in developing nations usually stems from public dissatisfaction with the pollution and degradation of the environment on which that public depends for their

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230. *See* Pakistan Environmental Protection Act, 1995, *reprinted in* Pakistan Law Digest, Martindale-Hubbell International Law Digest, Pak-3 (1996); 1992 Enhancement and Conservation of National Environmental Quality Act, BE 2535 (1992) (Thailand), *reprinted in* John R. Carino, *Environmental Law of Thailand* 13 (1996), *in* 2 COMPARATIVE ENVIRONMENTAL LAW AND REGULATION 13 (Nicholas A. Robinson ed., 1997). This process can take a considerable length of time. One Thai environmental practitioner has observed that:

> it takes too long to deal with environmental problems because it takes so long to pass legislation. . . . [There is] a three year delay to pass legislation implementing policy in Thailand. Similarly, . . . it can take anywhere from three months to five years to enact legislation in Hong Kong. Somehow, it seems that all over the world, the more important the problem, the longer it takes to enact legislation and a proper enforcement scheme.

STANDING COMMITTEE ON ENVIRONMENTAL LAW, A.B.A., ENVIRONMENTAL REGULATION IN PACIFIC RIM NATIONS 162-63 (1993) [hereinafter ENVIRONMENTAL REGULATION].

231. For example, in the United States, the regulatory approach is shifting from command and control regulation to market-based incentives. Richard B. Stewart, *Models for Environmental Regulation: Central Planning Versus Market-Based Approaches*, 19 B.C. ENVTL. AFFAIRS L. REV. 547, 552 (1992). *See infra* notes 260-70 and accompanying text for a discussion of these different regulatory approaches. In the market sector, all property is privately owned and the sole means of transfer is voluntary exchange. MERCURO ET AL., *supra* note 219, at 81-82. Individuals are expected to specialize in producing a particular skill or service and then to engage in trade with other such specialists to maximize their well being. In the public sector, the allocation and distribution of all resources is determined by the state by means of the assignment of nontransferable status rights to individuals or groups who then may gain access to goods and resources. *Id.* at 82-83. In the communal sector, the individuals who make up a society decide that certain or all property is to be owned communally and be available to all. In a communal system, property is nontransferable. *Id.* at 83.

health and prosperity.[232] The public bears most of the costs of environmental externalities. Therefore, it makes sense that the public, or prominent sectors of it, become dissatisfied with the status quo and push for a different course of action with respect to those harms.[233]

Unregulated economic development, like rapid population growth, is a primary cause of environmental degradation and gives rise to increasing public will to regulate the environment.[234] Economic growth typically expands the middle-class that looks for improved quality of life, an important part of which is a cleaner environment, prompting demands for increased regulation.[235] One World Bank study has shown that, in a sample of nations, as per capita income increases, so does regulation of the environment.[236] Environmental regulation, however, typically does not occur until a nation has addressed more fundamental social needs such as feeding its population (or at least a substantial portion of it) or addressing any chronic public health issues.[237] Thus, environmental regulation depends on a nation having sufficient public will to push for the regulation of environmental degradation. In turn, that public will often depends upon the nation having sufficient financial and administrative capacity in the public sector to address more than the most fundamental social needs.

In addition to pushing the public sector directly, the public's environmental will in developing nations manifests itself in the formation and growth of environmental non-governmental organizations (NGOs).[238] NGOs not only serve as a mouthpiece for the public will, they also carry out a range of functions that promote environmental compliance in the nation: advocating for particular environmental legislation or regulation, providing training of environmental experts, monitoring local actors for compliance with government regulation, bringing enforcement actions in nations that permit citizen enforcement of environmental laws, and educat-

232. *See* PERCIVAL ET AL., *supra* note 17, at 4-6; BANKOFF & ELSTON, *supra* note 224, at 49-50; *supra* notes 215-19 and accompanying text.

233. *See* UNITED NATIONS ENVIRONMENT PROGRAM, POVERTY AND THE ENVIRONMENT 3, 54 (1990). In fact, poor people bear a disproportionate share of the cost of environmental degradation since "they tend to live in poor health and sanitary conditions in polluted urban areas and cannot afford to protect themselves or move." ESKELAND & JIMINEZ, *supra* note 15, at 44. *See also* UNITED NATIONS RESEARCH INSTITUTE FOR SOCIAL DEVELOPMENT, DEVELOPMENT, ENVIRONMENT AND PEOPLE: REPORT ON THE CONFERENCE ON THE SOCIAL DIMENSIONS OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT 5 (1992). However, it is typically the upwardly mobile middle class who exert the most political pressure for environmental regulation in order to further enhance their quality of life.

234. For example, Singapore expanded its environmental regulation because it saw "a need to satisfy the environmental aspirations . . . and recreational demands of an increasingly mobile managerial and professional class . . . ." BANKOFF & ELSTON, *supra* note 224, at 49-50. *See also Peru, Environmental Concern Grows*, *supra* note 216, ¶ 1.

235. *See* BANKOFF & ELSTON, *supra* note 224, at 49-50.

236. POLICY RESEARCH DEPARTMENT, THE WORLD BANK, ENVIRONMENTAL REGULATION AND DEVELOPMENT: A CROSS-COUNTRY EMPIRICAL ANALYSIS 22 (1995) [hereinafter CROSS-COUNTRY].

237. *See, e.g.*, TWENTY YEARS, *supra* note 196, at 2 (quoting Houari Boumédienne, former President of Algeria, who stated that "[i]f improving the environment means less bread for the Algerians, then I am against it.").

238. *See supra* notes 217-19 and accompanying text.

ing the public regarding the importance of the environment.[239] Like the public, NGOs have forced many of the pro-environment choices in developing nations while facing stiff political opposition.[240]

2. *The Rule of Law*

Many developing nations lack the particular legal institutions needed in order to create an effective NERI. these nations lack trained legal personnel as well as independent judicial or administrative decision makers to make impartial determinations based upon rules. In fact, political power often prevents the promulgation of legal rules, or, if rules are promulgated, stifles their enforcement. The problem stems from "[t]he shortcomings of the institutions responsible for enforcing environmental legislation administratively and judicially."[241]

Many developing nations lack an effective and independent judiciary.[242] Worse still, in some nations, particular interest groups, typically the very wealthy, control the legislature or the judiciary. This makes the enactment of environmental legislation difficult and results in the uneven enforcement of any enacted legislation. For example, in Indonesia, "the courts have not shown a willingness to act independently of executive policy or against well-connected parties and have been strongly criticised [sic] for their weakness in applying basic principles of environmental law."[243] Enforcement of environmental norms there has been mainly against smaller corporations and not against the more powerful larger corporations.[244] In order to effectively deter environmental harms, a nation must establish a credible regulatory infrastructure. A central part of such a credible infrastructure are administrative and judicial systems which demonstrate the cardinal Rule of Law principle that conduct should be governed by laws, promulgated in advance, and not by the arbitrary decisions of men or women.[245]

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239. *See id.*; WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 142.

240. *See* Phillippe J. Sands, *Environment, Community and International Law*, 20 HARV. INT'L L.J. 393, 394 (1989); ENVIRONMENTAL REGULATION, *supra* note 230, at 96, 159.

241. BRAÑES, *supra* note 67, at 45.

242. WORLD BANK, NATIONAL ENVIRONMENTAL STRATEGIES: LEARNING FROM EXPERIENCE 44 (1995).

243. CAROL WARREN & KYLIE ELSTON, ENVIRONMENTAL REGULATION IN INDONESIA 12 (1994).

244. *Id.* Similarly, the Organization for Economic Cooperation and Development (OECD) has observed that:

> Although many countries have passed laws and regulations to protect the environment and natural resources, and to control polution, no illusions should be nursed on this score. The legislation is rarely enforced for lack of sufficient technical and administrative resources and sometimes because of powerful groups which derive incomes from the rapid exploitation [of the environment] and are able to modify or bypass the conservation measures.

Randall Baker, *Institutional Innovation, Development, and Environmental Management: An Administrative Trap Revisited, Part I*, 9 PUB. ADMIN. & DEV. 45 (1989) (quoting OECD, *Aid and Environmental Protection Ten Years After Stockholm* (1982)).

245. GEOFFREY DEQ. WALKER, THE RULE OF LAW 1 (1988).

Even in a developed nation (like the United States) that has a sophisticated administrative apparatus, a sophisticated judiciary, and substantial funding for addressing environmental problems, "the number of [environmental] violations overwhelm[s] the enforcement capacity of [the government]."[246] This problem becomes more aggravated in the developing world where there are far fewer government resources, unsophisticated industrial technology, and greater populations to be regulated. Enforcement resources are limited and there are a tremendous number and variety of regulatory targets that must be brought into compliance if enforcement is to be effective.[247] Also, regulations are often poorly designed and difficult to enforce.[248] Developing nations, however, need some measure of credible regulation if their laws are to affect their people's conduct. If there is not a system of rules, a means of ascertaining whether a rule violation has occurred, and an adjudicator who has the authority to impose sanctions upon rule breakers, then there is little chance that those in the particular jurisdiction will respect the paper law restrictions placed upon the use of the environment.[249]

3. *The Lack of Fair and Established Private Property Rights; Inadequate Human Rights*

Environmental reform is often at odds with existing property rights as well as with human rights.[250] In many developing nations, one primary impediment to forming a substantial environmental regulatory infrastructure is that in order to form such a system, massive reform of property rights would be necessary.[251] This reform of laws with respect to rights of pri-

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246. PERCIVAL ET AL., *supra* note 17, at 1039.

247. *See id.* at 1040. *See also supra* note 16 and accompanying text.

248. *Id.*

249. ORGANIZATION FOR ECONOMIC DEVELOPMENT AND COOPERATION, ECONOMIC INSTRUMENTS FOR ENVIRONMENTAL MANAGEMENT IN DEVELOPING COUNTRIES 25 (1993) [hereinafter OECD] (noting "gross violations" of town and country laws: "30 story buildings with perfectly legal papers dominate in areas where 3 stories is the legal maximum.").

250. Warren and Elston have observed that:

> [In Indonesia,] [m]ounting evidence of the economic and social costs of environmental degradation, the rise of a middle class, and the connection between environmental questions and other hotly contested political issues such as conflicts over land tenure and resources, the rights of workers, farmers and indigenous minorities, the demand for democratization and greater press freedom all played a part in moving the environment to center stage.

WARREN & ELSTON, *supra* note 243, at 7. *See also id.* at 16 (discussing relationship between environmental regulation and "poverty alleviation").

251. *See* ENVIRONMENTAL REGULATION, *supra* note 230, at 121. This is because "[s]ound environmental policies are likely to be powerfully redistributive." WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 2. Speaking about the Philippines, one local lawyer opined that:

> [i]ntrinsic to protecting our forests is empowering the people living in them. In our case, they are indigenous peoples. The eight million indigenous residents stand to lose now, because our culture and legal system do not recognize their property tenure relationships and claim that they do not own the land but are merely squatters because they are on public lands. The problem is whether we should maintain this kind of loss or indigenize our property systems such that

vate property ownership, limitations on the use of privately owned property ("regulatory takings" issues), and limitations on the use of public property very often runs counter to the interests of very large landowners.[252] Typically, these parties are often the most politically and economically powerful members of the society, making legal and political changes that adversely affect them very difficult to obtain.[253]

With respect to human rights, one commentator has observed that "[i]n many developing nations an attitude of disregard for the environment goes hand in hand with manifest violations of basic human rights; primarily of rural populations, women and indigenous peoples."[254] The fact that environmental regulation has a substantial nexus with these divisive, complex political issues makes the establishment of an effective NERI considerably more difficult to achieve.

4. *The Costs of Regulation*

The issue of who will pay the tremendous costs of forming an environmental regulatory infrastructure is another related fundamental political issue regarding environmental regulation of developing nations. Internalizing costs means that once "free" activities must be paid for by someone, they cannot remain free. These costs include: retro-fitting or new construction of capital facilities so that they are more environmentally friendly, public education to promote environment-friendly conduct, and the funding of a substantial regulatory apparatus.

There are several reasons why developing nations are reluctant or unable to pay these costs. First, in many cases, they do not have the money

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eventually we can empower the indigenous peoples. [This] situation can be [said to exist] in other countries such as Brazil, Indonesia, [and] Thailand. ENVIRONMENTAL REGULATION, *supra* note 230, at 121.

Following redistribution, stable property rights should be encouraged and developed in order to promote an effective regulatory system. *See* CROSS COUNTRY, *supra* note 236, at 16; HAMMER & SHETTY, *supra* note 13, at 3. One reason that established private property rights are beneficial is that private parties tend to use their own property in a manner that is much more conservative and less harmful to the environment than does a user of public property. This is because, in a private property regime, externalities such as resource depletion and pollution are borne largely by the private owner rather than by the public. *See* PERCIVAL ET AL., *supra* note 17, at 131. Of course this is true more for resource exploitation and for pollution of the soil and groundwater, pollution that remains upon the property rather than pollution that is carried away, externalized, by a stream of water or air. This often noted "tragedy of the commons" is diminished by private ownership. *Id.*

252. *See, e.g.*, ENVIRONMENTAL REGULATION, *supra* note 230, at 104 ("During [the Marcos regime in the Philippines], the problem was not so much the lack of laws but a disregard for them whenever they interfered with government priorities. . . . [L]aws were ignored whenever projects were deemed crucial to the government at the time.").

253. *See id.*

254. Matthew Nimetz, *Book Review*, 6 HARV. HUM. RTS. J. 253 (1993). Also, see the 1996 incident involving Ken Saro-Wiwa in Nigeria where nine environmental activists speaking out against Shell Oil's practices in that country were executed for their activities. Howard W. French, *Nigeria Executes Critic of Regime; Nations Protest*, N.Y. TIMES, Nov. 11, 1995, at 1.

to pay them.[255] In effect, having no cash, the only thing these nations have to spend is their natural resources. Second, even if a particular developing nation can afford to erect some sort of regulatory system, political or administrative decision makers are likely to believe that regulation will advesely affect the nation's international economic competitiveness by increasing the cost of the goods produced in the country.[256] Third, many nations feel that it is their sovereign right to pollute within their borders in order to grow their economies.[257] Fourth, even if they could afford to pay these costs, given their limited resources, they believe the money could be better spent elsewhere.[258] These nations would rather spend the value of their natural resources than spend money to conserve those resources for the future. Given the developing nations' inability and reluctance to pay for a new regulatory framework, the developed nations may have to provide substantial funding if the developing nations are to systematically regulate the use of their natural environments.[259]

Environmental regimes in developing nations, even if they make it to the point when there are laws on the books, often have poor actual enforcement.[260] The next section makes several recommendations which, if implemented, would promote the formation and effective enforcement of environmental regulations in developing nations.

C. Characteristics of an Effective National Environmental Regulatory Infrastructure (NERI)

1. *The System Should Suit the Needs of the Particular Nation*

The first concern in designing a national environmental regime is that it suits the needs of a particular nation. The unique needs and public priorities of a given nation must be taken into account to ensure the effectiveness of the regime.[261] Many developing nations have modeled their environmental regulations upon those of the more developed countries.[262] These

255. Cynthia B. Schultz & Tamara Raye Crockett, *Economic Development, Democratization, and Environmental Protection in Eastern Europe*, 18 B.C. ENVTL. AFF. L. REV. 53, 58, n.28 (1990); WILSON, *supra* note 24, at 969-71.

256. *See* Richard B. Stewart, *Environmental Regulation and International Competitiveness*, 102 YALE L.J. 2039, 2056 (1993).

257. *See supra* notes 79-82 and accompanying text.

258. *See supra* note 237 and accompanying text.

259. Maurice Strong, the secretary general of the Earth Summit, estimated that developing nations would require up to $125 billion per year in financial assistance to implement effective environmental management systems and steer their economies on a more sustainable course. Mark Lewis, *Balancing Industry with the Ecology*, N.Y. TIMES, Mar. 12, 1992, at A3. *See also* Schultz & Crockett, *supra* note 255, at 58 n.28.

260. *See* BAKER & MCKENZIE, *supra* note 211, at 1; BRAÑES, *supra* note 67, at 106-07.

261. *See* Wilson, *supra* note 27, at 954.

262. *See supra* note 229 and accompanying text. One practitioner stated that:

> There are plenty of laws on the books in East Asia to address environmental issues, but many are misguided and over-reactive. Most laws are based on OECD models that set ambitious goals for pollutants and environmental indicators, and rely primarily on source-specific standards. But experience in environmental policymaking over the past three decades in OECD countries demonstrates that these laws can be costly. The cost of environmental regula-

laws, which typically set physical standards and are expensive to administer, often are ineffective in developing nations because of a lack of information at the rule design stage as well as a lack of sufficient administrative capacity to enforce those rules.[263] The result is that inappropriate standards are weakly enforced. To be effective, environmental law requires a country-specific approach which takes into account the technical, financial, and administrative capabilities of the individual nation.[264]

A central issue in environmental regulation is whether "command and control" type regulation is better than regulation that uses economic incentives.[265] An example of a "command and control" regulation is a requirement that a facility emit less than a specified level of a pollutant or a requirement that a facility employ a particular pollution-reducing technology.[266] The main criticism of this type of regulation is that it does not offer any incentives to the operator of a facility to reduce a facility's pollution below the mandated level.[267] Once the mandated level is reached or the mandated technology is installed, the facility is in compliance with the law and no further reduction in pollution will benefit the operator. In contrast, economic incentives seek to directly impose the cost of each unit of pollution upon the operator by means of taxes on the consumption of a resource or on facility emissions.[268] The goal of economic incentives is to reflect the full cost of pollution in the pricing of the goods or services produced. Therefore, proponents of this means of regulation argue that government subsidies on resources should be ended and charges should be imposed on all pollution to reflect accurately the cost of that pollution.[269] The end result, of course, is to pass the cost on to consumers in the form of a higher price for the goods or services, rather than to impose the cost on the natural environment. Like most dichotomies, however, the characterization of the issue as command and control versus economic incentives obscures the best answer. In fact, the better choice will depend on the decision maker's particular environmental goal and the decision maker's priorities with respect to competing environmental values.[270]

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tion is particularly relevant in East Asia, where despite the recent rapid growth, many social needs still remain unaddressed.

BAKER & MCKENZIE, *supra* note 211, at 12.

263. Smith, *supra* note 94, at 12-13.

264. Speaking of East Asian countries, one commentator has observed that, "[s]ophisticated and costly monitoring requirements remain beyond the financial and technical capabilities of most environmental regulatory agencies . . . despite their best efforts." *Id.* at 13.

265. Professor McGarity has suggested 6 criteria for evaluating and comparing regulatory strategies: (1) administrative feasibility, (2) survivability (under existing conditions of judicial and political review), (3) enforceability, (4) efficiency, (5) fairness and equity, and (6) ability to encourage technological advance. Thomas McGarity, *Media-Quality, Technology, and Cost-Benefit Balancing Strategies for Health and Environmental Regulation*, 46 LAW & CONTEMP. PROBS. 159 (1983).

266. *See, e.g.*, Stewart, *supra* note 231, at 548.

267. *See id.* at 550.

268. *See id.* at 548.

269. *See* HAMMER & SHETTY, *supra* note 13, at 3.

270. *See, e.g.*, PERCIVAL ET AL., *supra* note 17, at 166-76.

The trend in the international institutions examining the issue of environmental regulation in developing nations is to favor the use of economic incentives such as taxes, accurate pricing of resources, tradable pollution permits, and the elimination of subsidies.[271] However, this predisposition may have more to do with the fact that the authors of these documents either are themselves economists or are heavily influenced by economists who tend to prioritize efficiency gains over other values. In defense of a command and control approach, the former head of the United States Environmental Protection Agency argued in favor of the United States' primarily command and control environmental regime:

> The thrust of these [environmental] statutes . . . has been to set deadlines that were tough, mandate standards that were tough, force technology and the state of the art. I have fully supported that approach. I think it has made complete good sense. It has succeeded in getting the country off the mark, so to speak, in dealing with the problems. It probably carries with it certain penalties in terms of efficiency, both technological efficiency and economic efficiency. But I think that up to now these have been costs that have been well worth paying in order to get the country moving on these programs. If we had started to fine tune from the beginning, I think we would still be fine tuning and we would have very little progress in terms of cleanup.[272]

Command and control regulation may be more effective at getting an environmental regulatory system in place in the first instance, a starting position in which many developing nations find themselves currently.[273] The standards established by command and control regulations are clear and are more easily monitored and enforced than the constant reevaluation of the economic costs of particular resources and pollution that must be

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271. *See* HAMMER & SHETTY, *supra* note 13, at v *passim*; Ben Boer, *Institutionalising Ecologically Sustainable Development: The Roles of National, State, and Local Governments in Translating Grand Strategy Into Action*, 31 WILLAMETTE L. REV. 307, 324 (1995).

272. *Status of the Programs and Policies of the Environmental Protection Agency, Hearing Before the Subcomm. on Environmental Pollution of the Senate Comm. of Public Works*, 95th Cong., 1st Sess. 9 (1977) (statement of Russell Train) [hereinafter *Status of EPA*].

273. Additionally, developing nations pose particular problems that economists' models may not account for sufficiently. One commentator points out that:

> The *scarcity of public funds* in many LDCs, the *need to protect the poor and considerations of political economy* all indicate that transfer mechanisms are not well developed. Efficiency criteria then need to be supplemented by considering the distributive impact of different policy instruments. *Weak institutions* may severely hamper access to *information* and *the ability to monitor damages* and *implement sophisticated schemes*. Under these conditions, it is necessary to analyze what can be achieved through imperfect incentives based on blunt, indirect instruments, for instance by applying presumptive pollution taxes to fuels. Further, the frequently applied assumption of a *competitive market structure* may be less realistic (but not necessarily less useful as a base line) in an LDC context than in an industrialized market economy. The role and functioning of instruments such as taxes and quantitative regulations will of course not be the same in the presence of *market power, soft budget constraints and administered prices*, as under the standard assumptions.

reflected in the pricing of the economic incentives.[274] In deciding between the two types, regulators should look at the regulatory goals, and the amount of resources at their, and the target of the regulation's, disposal, and then decide which form of regulation will best achieve those goals.[275]

2. *Private Enforcement Actions Should Be Available*

Another characteristic of an effective regulatory system is the assurance of public access to national courts and meaningful remedies for those seeking environmental enforcement or redress.[276] While the United States relies on liability and the threat of citizen suits for much of the enforcement of its environmental laws and regulations, many nations' judicial systems do not permit private suits, in which the citizen acts as a "private attorney general."[277] This leaves enforcement to the public agency charged with enforcing the laws, severely limiting the effectiveness of any promulgated standards.[278] One Filipino attorney, B. Norman V. Kalagayan, put the problem in his country as follows: "[a]t the same time that too much of the implementation is conducted by the government, the government acknowledges that it lacks the resources to enforce environmental laws. . . . These shortcomings in government enforcement should be complemented by the private sector."[279] Even in those countries that permit citizen suits, problems of proving that a particular actor or class of actors caused the harm can be very difficult because the polluter has the evidence, or

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ESKELAND & JIMINEZ, *supra* note 15, at 4.

274. *But see Status of EPA*, *supra* note 272 (arguing that the World Bank recommends that even if pricing is uncertain then a system of economic incentives is preferable because it can always be "fine tuned").

275. For example, proponents of economic incentives point out that, in developing countries, "there is a mismatch between high regulation, monitoring and enforcement costs and budgetary, manpower and administrative constraints . . . ." OECD, *supra* note 249, at 24.

276. *See* Mark Spaulding, *Transparency of Environmental Regulation and Public Participation In The Resolution of International Environmental Disputes*, 35 SANTA CLARA L. REV. 1127, 1134 (1992) (noting that these principles are included in the nonbinding United Nations' Rio Principle 10 and in the North American Free Trade Agreement side agreements).

277. ENVIRONMENTAL REGULATION, *supra* note 230, at 142.

278. With respect to the lack of private rights to litigate, one commentator has observed that:

> [T]he conditions in the United States that allow litigation to flourish are hard to find elsewhere: well-established environmental laws and duties; agencies that are open to public scrutiny; individuals or groups with money to spend on disputes; lawyers prepared to sue governments, and governments prepared to be sued. For someone like Professor Wangari Maathai, leader of the Green Belt Movement in Kenya, to seek an injunction against the construction of the Kenya Times Media Trust building in Uhuru Park Nairobi, requires not only the money to bring a case, but the physical and moral courage to stand up to intimidation from politicians, from President Moi downwards. In countries dealing with what Professor Maathai called 'basic human rights issues, basic democracy, [and] basic willingness to accommodate dissent,' the benefits of U.S. litigation are difficult to imagine.

Wilson, *supra* note 27, at 957.

279. ENVIRONMENTAL REGULATION, *supra* note 230, at 106.

because the evidence is too hard to trace back to the polluter, or because the plaintiffs lack the scientific or legal capacity to muster and present convincing evidence of an environmental violation.[280] Speaking at an American Bar Association Conference on Environmental Regulation in Pacific Rim Nations, Kalagayan explained that:

> [t]he problems encountered in the prosecution of pollution cases are chiefly logistical. Most of our clients are poor communities or neighborhood associations that do not have enough money to pay for a chemical analysis of suspected pollutants. When these associations are pitted against huge establishments, they usually lose the case due to insufficient evidence or sheer exhaustion.[281]

If the plaintiffs are not deterred by standing or proof problems, then political or judicial unwillingness to provide relief under existing laws may nullify their claim. If the political tenor of a country is anti-environmental, then the institutions charged with enforcing the laws, because often they are controlled by or beholden to politically motivated actors or are political creatures themselves, will often fail to enforce those laws.[282] A political and legal regime which permits this expression of the public will is preferable not only because it increases the number of potential enforcers, but also because a regime which confers such enforcement power is more consistent with democratic principles of government, such as empowerment of the population and recognition and representation of popular political constituencies.[283]

3. *Technical Expertise and Data Useful to the Formation of Environmental Policies and to Private Environmental Litigators Should Be Collected and Made Available to the Public*

The development of an effective NERI further depends upon the gathering and analysis of data used to develop environmental policies. Two problems arise: a shortage of trained experts and a shortage of data which such experts could compile and analyze. Many developing nations lack the technical expertise to obtain and analyze such environmental data effectively.[284] Because environmental law relies on sciences such as biology, toxicology, and ecology, a developing nation needs to have a pool of experts trained in these disciplines to develop and enforce effective poli-

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280. *See, e.g., id.*; WARREN & ELSTON, *supra* note 243, at 12 ("the Legal Aid Institute was unable to prosecute their case for compensation in the courts because of the difficulty of proving liability.").

281. ENVIRONMENTAL REGULATION, *supra* note 230, at 106.

282. *See* WARREN & ELSTON, *supra* note 243, at 12. Warren and Elston observe that: "Ultimately, upgrading environmental practices depends as much upon the changing political context within which they operate, as it does on the technical provisions of the new regulatory regime." *Id. See also supra* Part III.B.2.

283. Note that those countries that do not permit citizen action often are the countries with the more restrictive political regimes and are often the most anti-democratic and reluctant to change their property laws to restrict the use of natural resources by political elites. *See, e.g.*, Schultz & Crockett, *supra* note 255, at 53-54.

284. *See* WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 142; ANNA DA SOLEDADE VIEIRA, ENVIRONMENTAL INFORMATION IN DEVELOPING NATIONS 73 (1985).

cies.[285] Additionally, these experts require sufficient laboratory capacity and other "hardware" to carry out their work.[286]

Having enough data to formulate sound environmental policies and standards is important because particular legal standards grow out of these policies and because environmental standards often must be very technically complex in order to be effective. For example, consider a clean air regulation which requires that emissions of a particular toxin remain below a fixed level, for example, ten parts per million. At the rule design stage, scientific data as to the effects of the toxin are needed to determine how many parts per million is dangerous to human health. At the rule enforcement stage, technical capacity is needed to determine whether there has been a release of more than ten parts per million.[287] Because of the intimate relation between environmental law and environmental science, technical capacity is indispensable to both the design and enforcement of environmental rules.

Once the technical capacity exists and data is generated (whether at the initial stage of policy formation or later when the standards are in place and ongoing compliance monitoring is necessary), public access to environmental information becomes an important aspect of an effective national environmental regulatory scheme.[288] Principle 10 of the Rio Declaration on Environment and Development provides that:

> [E]nvironmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment, that is held by public authorities, including information on hazardous materials and activities in their communities. . . . States shall facilitate and encourage public awareness and participation by making information widely available.[289]

This language, included in a non-binding United Nations declaration, endorses the principle that access to information is necessary to secure citizen participation in the decision making process with regard to environmental regulation. Access to information also complements the right to

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285. WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 142.

286. VIEIRA, *supra* note 284, at 53.

287. One analyst has proposed that the information needs of personnel concerned with pollution control are the following:

- Reliable data on wastes and pollution concentration levels, uniformly collected, synthesized and supplied on a time-series basis.
- A recently written authoritative survey or small collection of key surveys, likely to identify the main problem areas relevant to the discipline, to establish the technology appropriate for tackling those problems and to draw on the state of the art in the subject area.
- A list of references appropriate to the problem area under consideration.
- A cheap current awareness service to update these references.
- A list of research organizations, research and workers in the specific environmental area of interest.

Id. at 125.

288. *See, e.g.*, Boer, *supra* note 271, at 332.

289. Rio Declaration, *supra* note 81, at 878.

bring private legal enforcement actions against violators discussed above in Part III.C.3.[290]

Often, reporting requirements imposed upon private companies provide a means of moving otherwise private information into the public domain, thereby making such information available to the public.[291] Additionally, such disclosure provides the government with information necessary to make and enforce environmental rules.[292] One example of this type of approach is the United States Environmental Protection Agency's website which provides the contents of private firms' disclosures of the location of hazardous materials within their operations.[293] Such reporting requirements promote self-regulation by the private sector, promoting compliance with rules that, given the limited resources of environmental agencies, would otherwise not be as well monitored. However, as one commentator has observed, if reporting requirements are to be an effective part of a regulatory scheme, "[i]ndustry, environmental groups, and governmental agencies must develop uniform standards in terms of scientific and analytical methodologies and basic problem-solving techniques before uniform reductions in environmental damage may move forward."[294]

Creating public access to environmental information allows individual citizens to gather the information necessary to evaluate the state of their local environments, to bring effective citizen suits, and to lobby their government to take environmental action, and allows NGOs to collect information for their advocacy and lobbying efforts.[295] In facilitating these efforts, public access is a vital part of an effective national environmental infrastructure.

4. *Policy Makers Should Use Environmental Impact Assessment to Plan Ahead*

Environmental impact assessment (EIA) is increasingly being used to predict the costs of activities that have the potential to harm the environment.[296] By assessing the likely environmental impact of a planned course

290. *Id.* Access to information potentially addresses the proof problems discussed above which prevent many citizens from taking legal action.

291. PERCIVAL ET AL., *supra* note 17, at 1042, 1050.

292. *See* WORLD DEVELOPMENT REPORT 1992, *supra* note 13, at 14.

293. United States Environmental Protection Agency, *Envirofacts Warehouse – Toxics Release Inventory* (last modified Dec. 16, 1997) <http://www.EPA.gov/enviro/html/tris/tris_overview.html>.

294. Barbara A. Boczar, *Toward a Viable Environmental Regulatory Framework: From Corporate Environmental Management to Regulatory Consensus*, 6 DEPAUL BUS. L.J. 291, 293 (1994). This may be a good area for international standards to apply because it establishes a methodology for measuring and calculating damage without imposing particular quantitative restrictions upon individual nations.

295. *See* UNITED NATIONS RESEARCH INSTITUTE FOR SOCIAL DEVELOPMENT, *supra* note 233, at 9.

296. IMPACT OF ENVIRONMENTAL ASSESSMENT, *supra* note 170, at XV; ENVIRONMENTAL RISK ASSESSMENT, *supra* note 170, at 8. Note that EIA is a term for a broad approach to discover the potential environmental harms of a particular project, but beyond this general definition there is "little unanimity as to how a comprehensive EIA program should be administered." ENVIRONMENTAL REGULATION, *supra* note 230, at 84. EIA is another

of action, EIA is "a way to tackle pollution problems proactively – evaluating a project prior to building it and determining whether it should be built in the first instance – as distinguished from the regulatory model which merely ensures that whatever is [already] built complies with a standard . . . ."[297] The concept of EIA had its genesis in the United States in the National Environmental Policy Act (NEPA), passed in 1970. The Act required the party proposing the potentially harmful action to make a detailed statement about:

> (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.[298]

Many developing nations have adopted EIA as one component of their regulatory infrastructure.[299] This adoption should be promoted as much as possible because, absent formal legal requirements that EIA be conducted, the potential environmental harms of a project are often not perceived or are ignored.[300] Another reason why nations should adopt EIA procedures is that environmental costs for both the nation and a development project's sponsor often are considerably reduced by means of careful environmental planning as opposed to retrospective regulation of current or past harms.[301] EIA has been promoted in the international arena, and has been favorably characterized as a means by which the decision making process

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area where international law would be well-suited to provide a broad principle which individual nations could apply in a variety of ways depending on the particular needs of the nation.

297. ENVIRONMENTAL REGULATION, *supra* note 230, at 84.

298. 42 U.S.C. § 4332(c) (1994). Ideally, as did the United States government with NEPA, the developing nation's government would subject its own actions to the EIA process. This is particularly important in infrastructure development because the vast majority of that development is carried out by the public sector.

299. For example, Malaysia, the Philippines, and Indonesia all have enacted EIA requirements. *See* BANKOFF & ELSTON, *supra* note 224, at 11, 57. So has China. *See* BARBARA J. SINKULE & LEONARD ORTOLANO, IMPLEMENTING ENVIRONMENTAL POLICY IN CHINA, Preface (1995). Closer to home, so has Mexico. *See* Hector Herrera, *Mexican Environmental Legal Framework*, 2 SAN DIEGO JUST. J. 31, 33 (1994). However, Herrera goes on to state that:

> Singapore stands out from its immediate Southeast Asian Neighbors because of the absence of a formal EIA procedure. . . . EIAs have been objected to in Singapore on the grounds that such procedures delay or even inhibit development, that they add substantially to costs, and that they often introduce factors extraneous to the development process.

Id. at 51. It seems likely that the "extraneous" factors Herrera refers to are the kind of broad public participation referred to *supra* Part III.B.1.

300. *See* Nickerson, *supra* note 224, at 228 (Zimbabwe has "no national legislation requiring environmental impact assessments to be performed for projects that may have an adverse effect on the environment. The tendency in some areas, therefore, may be to overlook environmental problems.").

301. *See* ENVIRONMENTAL REGULATION, *supra* note 230, at 157.

can be opened to "broad public participation."[302] It is an essential component in any effective NERI.

5. Criminal Sanctions Should be Employed

Criminal sanctions are another effective environmental enforcement mechanism that some developing nations employ.[303] Enforcement of criminal sanctions demonstrates that environmental regulation is a priority of the state and can be an effective deterrent to harmful action.[304] However, selective prosecution has been a widespread problem. Larger, more powerful violators use their political influence to avoid being prosecuted.[305] This leaves the smaller, less powerful violators, typically smaller businesses, to bear the brunt of criminal prosecution.[306] This selective enforcement undercuts the effectiveness of deterrence, discriminates against smaller businesses, making the market less competitive, and undercuts the public's perception that environmental enforcement is just. Therefore, in implementing an NERI which includes criminal sanctions, it is necessary to monitor the evenhandedness and effectiveness of the enforcement.

D. The International Community Should Promote National Regulation

The international community, specifically the developed nations, should provide financial and technical assistance to developing nations to establish effective NERIs. While, as discussed above, international environmental law is not binding upon individual states until it is ratified by those states, it does provide a coherent set of broad principles that individual nations have used as a basis for their own national environmental policies and legislation.[307] For example, in 1980, the International Union for the Conservation of Nature and Natural Resources (IUCN), published its World Conservation Strategy, which prompted many national governments to implement a national conservation strategy.[308] In 1982, the United Nations promulgated its World Charter for Nature which set out

302. Agenda 21, *supra* note 192, ch. 23.2. Additionally, EIA, when taken seriously by decision makers is a means of involving a broad range of constituencies in the decision making process with regard to a given project. *See* ENVIRONMENTAL REGULATION, *supra* note 230, at 157. The participation of the public and NGOs should be sought out during the EIA process because the consideration of a broader range of interests will usually yield a better decision. *Id.*

303. *See, e.g.*, John W. Head, *Using Criminal Sanctions to Fight Environmental Damage in the P.R.C.*, 17 E. ASIAN EXEC. REP. 9 (1995) (discussing the promulgation and enforcement in China of criminal sanctions for environmental offenses).

304. PERCIVAL ET AL., *supra* note 17, at 1058-60; Kent Greenawalt, *Punishment, in* 4 ENCYCLOPEDIA OF CRIME AND JUSTICE 1336, 1340-41 (1983); CRIMINAL LAW AND THE ENVIRONMENT 7 (Hans-Jorg Albrecht & Seppo Leppa eds., 1992).

305. ENVIRONMENTAL REGULATION, *supra* note 230, at 163. This problem is not limited to the developing nations; selective prosecution is a problem in developed nations too. *Id.*

306. *Id.*

307. *See* Boer, *supra* note 271, at 309.

308. *Id.* at 308.

further broad principles for the design of national legislation.[309] This was followed by Agenda 21, promulgated at the 1992 Rio Conference on the Environment and Development.[310] However, while these documents laid out broad principles, they did not address the design of an effective national regulatory system that addresses local environmental concerns, a complex and expensive task. To aid in the development of national regulatory systems, the international community, and the developed nations in particular, must provide technical and financial assistance to the developing nations.[311]

Some assistance, often termed "capacity building," has been given. Capacity building assistance has been given to developing nations by the IUCN as well as by the World Bank which, as of 1994, had ongoing or planned projects in twenty-nine developing nations.[312] Additionally, the United Nations Environment Program (UNEP) provides "technical, legal, and institutional assistance for the development of national environmental legislation."[313] These providers of assistance present workshops for developing nations' environmental officials, draft environmental legislation, review any existing legislation, and supply expert advice to environmental agencies in developing nations.[314] However, these programs are too limited in scope. Environmental capacity-building assistance to developing nations should be expanded.

Currently, there are several funding mechanisms by means of which the developed world transfers money to the developing world for environmental projects, the most prominent of which is the World Bank's Global Environment Facility (GEF).[315] GEF provides loans for projects that address biological diversity, forestry, global warming, or ozone depletion when those projects do not meet traditional lending criteria. However, as noted above, GEF can only fund projects that address global environmental degradation, national environmental degradation does not qualify for funding.[316] Also, this fund does not have sufficient resources and has been criticized for its placement in the World Bank, which has been the sponsor of a number of projects that have been devastating to the environments in developing nations.[317] Additionally, development of regulatory infrastructure is only one of GEF's many goals, all of which must fight over its limited financing.

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309. *World Charter for Nature*, G.A. Res. 37/7, U.N. GAOR, 37th Sess., Supp. No. 51, at 17, U.N. Doc. A/Res/37/7 (1982), *reprinted in* 22 I.L.M 455 (1983).

310. Agenda 21, *supra* note 192.

311. *See* Di Leva, *supra* note 181, at 527 *passim*; Boer, *supra* note 271, at 329-31.

312. *See* Boer, *supra* note 271, at 329 (discussing IUCN assistance); Di Leva, *supra* note 181, at 534-36 (discussing the World Bank's assistance).

313. United Nations Environment Program, *Environmental Law in the UNEP – Program Element 4.3* (visited Sept. 27, 1997) <http://www.unep.no/unep/sub43.htm>.

314. *See* Boer, *supra* note 271, at 329-331; Di Leva, *supra* note 181, at 533-34.

315. PERCIVAL ET AL., *supra* note 17, at 1357.

316. *See supra* note 201 and accompanying text.

317. PERCIVAL ET AL., *supra* note 17, at 1358; Nimetz, *supra* note 254, at 253.

Substantial amounts of foreign aid are needed to address the full range of environmental needs that arise consequent to the development in such a large percentage of the world.[318] Given the current level of funding for such services at GEF, UNEP and IUCN, however, nothing close to the amount of aid needed is forthcoming.

Conclusion

Decision makers and academics in developed nations have emphasized international law as the best means for regulating the environments of developing nations.[319] That emphasis should shift to developing and expanding effective national environmental regulatory infrastructure in developing nations. These systems should employ the expertise of and receive financial assistance from developed nations and the international community, but the emphasis must be on nationally oriented, as opposed to internationally oriented, systems for several reasons. First, every environmental problem emanates from a particular source in a particular place. A national regulatory system will be more effective at local monitoring and sanctioning. A national system also permits information to move more freely between the community, the regulators, and the regulated. Second, by its nature, international law is made up of broadly worded principles that 1) are not binding law until ratified by an individual nation and 2) are not useful until there is an institutional capability to adjudicate individual cases.

Third, a NERI reflects the public will of that nation and is an expression of the choice of the sovereign. Therefore, it is more likely that a NERI system will have the support of that government and of the public than would an internationally established policing mechanism. Lastly, there are simply not enough international or private resources to police the global environment. The majority of the cost of the regulatory system must be paid for out of the pockets of the developing nations, to which end the pricing of goods and services available to the public must include not only the cost of the environmental harms, but also the cost of the system of environmental regulation itself.

There are compelling reasons why a NERI regime is beneficial both to development and to the protection of the environment. Its benefit to the latter should go without saying. As to the former, from the perspective of the investor, a developed legal structure with clear rules regarding the extent of a corporation's potential environmental liabilities will encourage investment in that particular developing nation, thereby encouraging development.[320] If the host government were to upset the reliance of an invest-

318. *See* Lewis, *supra* note 259, at A3.

319. *See, e.g.*, PERCIVAL ET AL., *supra* note 17, at 1056 (discussing the history of regulation of the environment of developing nations solely in the context of international law).

320. An adequate legal structure encourages reliance by the investor. "[G]overnments are recognizing that companies (and their financiers) need an indication of the liabilities that might be imposed via changing environmental standards before they will make large investments." BOND & CARTER, *supra* note 91, at 34.

ing corporation by changing the environmental law regime during the project's lifetime, it would seriously jeopardize future foreign investments in that country. Given the global competition for development capital, a developing country should offer as much stability and certainty as it can to potential investors. A developed national regulatory regime will do much to promote stability and certainty.[321]

While there are major shortcomings in national environmental management regimes in developing nations, the developed world does commit some resources to assisting developing nations to regulate their environments.[322] National governments in developing nations have increasingly enacted laws and regulations or have increased administrative and enforcement mechanisms, almost invariably with some motivation or assistance from developed nations.[323] In the developed world, NGOs as well as MDBs have committed resources to promoting and funding the development of the environmental management capacity of developing nations, including assistance with drafting and promulgating effective regulatory instruments and with the cultivation of institutional capacity and enforcement mechanisms.[324] These international organizations have played and will continue to play a very important role in building regulatory capacity and capability in developing nations.[325]

However, more must be done. The great scale of the development of physical infrastructure to serve more that three-quarters of the Earth's population must be paralleled by the development of national environmental regulatory infrastructures. If it is not, it may well be that the grand physical structures were built for naught.

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321. Such a developed regime, given the rapidly changing character of environmental regulation at the national and international levels, could be given greater credibility if combined with stabilization clauses or sovereign guarantees in any agreements between the host sovereign and the project entity. *See supra* note 157 and accompanying text.

322. *See supra* note 201 and accompanying text.

323. *See* INTERNATIONAL FIN. CORP., INVESTING IN THE ENVIRONMENT — BUSINESS OPPORTUNITIES IN DEVELOPING COUNTRIES 30, 34, 43, 47, 49, 56 (1992) (discussing these developments in legal infrastructures in Chile, Hungary, Mexico, Pakistan, Poland, and Turkey).

324. "World Bank activities include . . . development of the environmental legal and institutional capacity of countries through technical assistance provided at the national and local levels . . ." including "preparation of a national framework environmental law." Di Leva, *supra* note 181, at 527. Di Leva's article mentions twenty-nine developing countries which are receiving assistance of this sort as of 1994. Other organizations which are offering technical assistance are the United Nations Development Programme, the United Nations Environmental Program, Food and Agriculture Organization of the United Nations and the World Conservation Union. *Id.* at 536.

325. *See* BRAÑES, *supra* note 67, at 73-100.