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International Environmental Law, the Public's Health, and Domestic Environmental Governance in Developing Countries

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INTERNATIONAL ENVIRONMENTAL LAW, THE PUBLIC'S HEALTH, AND DOMESTIC ENVIRONMENTAL GOVERNANCE IN DEVELOPING COUNTRIES

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I. PUBLIC HEALTH AND THE ENVIRONMENT: BACKGROUND

A. GENERAL

In an era of globalization where health threats transcend national borders, international law is an important instrument to fight diseases. International environmental law is one of the most important areas of law with the potential to advance health goals. The relationship between mankind and the environment is a close-knit one, as mankind strives to protect the environment and natural resources. Yet, human activities have created adverse environmental consequences that have led to ill health. Furthermore, diseases related to the environment are increasing at an alarming proportion. Health, environment, and natural resources are interdependent and are a key aspect of sustainable development today.[1] In the developing world, health is intimately linked to development.[2] Therefore, health coupled with a positive attitude towards environmental protection can promote sustainable economic development.[3]

A health perspective to environmental protection builds linkages between the anthropocentric and eco-centric approaches to

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1. *See* Edward P. Richards, *The Role of Medical and Public Health Services in Sustainable Development*, 32 ENVTL. L. REP. 11299, 11299 (2002), *available at* http://biotech.law.lsu.edu/Articles/32ELR11299.pdf. For example, Agenda 21, like the World Health Organization's broad definition of health, expands the traditional focus and emphasizes the need for improvement in basic medical care, preventive medicine, and physical and mental health.

2. *Id.* (explaining that when diseases like malaria or HIV/AIDS disable large parts of the population, economic development is less efficient, which can have an environmental impact); *see also* WORLD HEALTH ORG. [WHO], THE WORLD HEALTH REPORT 1999, at 1-12 (1999) (demonstrating the relationship between improvements in economic growth and corresponding improvements in health, suggesting that poor health conditions can trap people in poverty).

3. *See, e.g.*, WHO COMM'N ON MACROECONOMICS & HEALTH [WHO CMH], MACROECONOMICS AND HEALTH: INVESTING IN HEALTH FOR ECONOMIC DEVELOPMENT 1-3, 16 (Dec. 20, 2001) (presented by Jeffrey D. Sachs). Good health facilitates development and development often promotes good health. While improved health may be a prerequisite for development, some behavioral determinants of health such as attitudes towards the environment, people's lifestyles and consumption patterns, can impede sustainable development in the long run. *Id.*

environmental protection.[4] Environmental protection and protection of human health are not mutually exclusive, but rather mutually reinforcing.[5] The agenda for the protection of the global environment is largely embodied in the development of international environmental law. Despite the large body of international environmental law, its effective national implementation to achieve positive health outcomes in developing countries is beset by domestic legal and institutional bottlenecks. It is however argued that a linkage between health, environment, and natural resources ensures the complementary use of tools that can achieve positive outcomes for both health and the environment.[6] The positive contribution of environmental management to health promotion will continue to evolve.

While there is increasing scholarship on the role of international environmental law in the protection of health at the international plane, little has been explored on the interface between public health and environmental protection at the national level within developing

4. *See* Robert T. Lackey, *If Ecological Risk Assessment is the Answer, What is the Question?*, 3 HEALTH & ECOLOGICAL ASSESSMENT 3-4 (1997), *available at* http://www.epa.gov/wed/pages/stuff/lackey/pubs/question.htm; *see also* Carlos Corvalan et al., *Millennium Ecosystem Assessment Synthesis Report*, MILLENNIUM ECOSYSTEM ASSESSMENT, Mar. 23, 2005, at 9-18, 38, *available at* http://www.eco-index.org/search/pdfs/millenium_ecosystem_assessment.pdf (showing that health is an essential part of both an anthropocentric approach to environmental protection, which means that one assumes that the benefits of decisions regarding ecological systems are accruable to humans as a way of insuring the future, and an ecocentric approach, which views all species as equal and states that humans must make sound ecological decisions because protecting plants and animals is morally right).

5. *See* Kevin R. Gray, *World Summit on Sustainable Development: Accomplishments and New Directions?*, 52 INT'L & COMP. L.Q. 256, 256-57 (2003) (reporting the discussions and conclusions of the World Summit on Sustainable Development, which expanded the concept of sustainable development to include health and environmental concerns along with water and sanitation, energy, agriculture and biodiversity).

6. *See id.* at 267-68 (arguing that the purpose of the Summit was to balance global economic, social, and environmental concerns, which are considered interdependent and therefore essential to achieving sustainable development); *see also* Yasmin von Schirnding, *Health in Sustainable Development Planning: The Role of Indicators*, World Health Organization, Geneva 2002, 7-8, 105-20, *available at* http://www.who.int/wssd/resources/indicators/en/ (discussing the frameworks and tools for sustaining the linkages between health, environment, and development).

countries.[7] This article does not delve into the detailed discourse on ethnocentric and eco-centric perspectives of environmental protection. Rather, it discusses the linkages between human health and environmental protection, particularly in the view of increasing public health threats and the current use of environmental law. The article then analyzes this linkage in the context of domestic environmental governance mechanisms in developing countries and argues for an enhanced level of health protection within domestic environmental protection mechanisms.

B. ENVIRONMENT AND HEALTH THREATS

Health is affected to a great measure by environmental conditions. The WHO defines environment and health as including both the direct pathological effects of chemicals, radiation and some biological agents, and the effects on health and well-being of the broad physical, psychological, social and aesthetic environment, which includes housing, urban development, land use and transport.[8] Environment-related diseases continue to afflict many people, particularly the world's poorer people.[9]

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7. *See, e.g.*, Yasmin von Schirnding et al., *International Environmental Law and Global Public Health*, 80 BULL. WORLD HEALTH ORG. 970, 972-73 (2002) (considering the increasing contribution of international environmental conventions to the promotion of global public health). *See generally* David P. Fidler, *Challenges to Humanity's Health: The Contributions of International Environmental Law to National and Global Public Health*, 31 ENVTL. L. REP. 10048 (2001) (examining the transnational public health implications of specific environmental threats at the national level and the treaties that make up international environmental law seeking to counter the health-damaging consequences).

8. *See generally* WHO REGIONAL OFFICE FOR EUROPE [WHO ROE], ENVIRONMENT AND HEALTH: THE EUROPEAN CHARTER AND COMMENTARY (1989).

9. *See* WORLD RESOURCES INSTITUTE [WRI] ET AL., WORLD RESOURCES 1998-99, at 1 (1998) (suggesting that in the least developed countries many die or suffer ill health each year because of environmental health threats resulting from sanitation concerns, poor housing, and disease-carrying insects). Such afflictions are avoidable in wealthier nations. *Id.*; *see also* Kirk R. Smith et al., *How Much Ill Health Is Attributable to Environmental Factors?*, 10 EPIDEMIOLOGY 573, 573, 581-83 (1999) (stating that an estimated "25-33% of the global burden of disease can be attributed to environmental risk factors," and that this percentage decreases with economic development, meaning that people in the least developed countries are most at risk).

For example, diarrhoeal diseases, largely preventable through access to safe drinking water, sanitation and food hygiene, claim 1.5 million lives a year.[10] At the beginning of 2000, a substantial portion of the world's population was without access to improved water supply and sanitation.[11] Africa and Asia are two areas where this problem appears particularly rampant.[12] Diarrhoeal and other diseases spread when water supplies and sanitary conditions are inadequate. Furthermore, land based marine pollution, caused by untreated sewage and chemicals, contaminate coastal waters inhabited by humans. Sewage and other nutrient rich pollutants are breeding grounds for microbes that may be fed into the food chain when consumed by fish. This form of pollution also leads to algae blooms that can cause a form of cholera.[13] Marine pollution provides a vivid example of how a local source of pollution can contribute to the global spread of infectious diseases.

Air pollution is also associated with a variety of health risks. Acute respiratory infections such as pneumonia are the leading killers of young children, and also associated with such factors as indoor air pollution. Indeed, nearly three billion people in developing countries still rely on traditional biomass fuels such as wood and

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10. *See* WHO, *Health in the Context of Sustainable Development*, at 16, WHO Doc. WHO/HDE/HID/02.6 (2002) (prepared by Y. von Schirnding & C. Mulholland) (stating that these deaths could be easily prevented by simple means such as the use of oral rehydration salts); *see also* WHO & UNICEF Joint Monitoring Programme for Water Supply & Sanitation, Global Water Supply & Sanitation Assessment 2000 Report, Main Findings (2000), http://www.who.int/docstore/water_sanitation_health/Globassessment/GlobalTOC.htm (follow "Main Findings" hyperlink) [hereinafter WHO & UNICEF].

11. *See* WHO, *supra* note 10, at 16 ("1 billion people are without access to improved water supply, and 2.4 billion lack access to improved sanitation."); *see also* WHO, HEALTH FOR ALL IN THE TWENTY-FIRST CENTURY ¶ 26 (1998) [hereinafter WHO, HEALTH FOR ALL].

12. *See* WHO & UNICEF, *supra* note 10 ("[F]ewer than one-half of all Asians have access to improved sanitation and two out of five Africans lack improved water supply.").

13. *See* WHO ET AL., CLIMATE CHANGE AND HUMAN HEALTH 99 (A.J. McMichael et al. eds., 1996) (prepared by M. Ando et al.) (providing scientific evidence of an ecosystem-based view of cholera transmission where scientists have made connections between human and natural disturbances of coastal ecosystems causing coastal algae blooms and fluctuations in cholera).

charcoal that cause indoor air pollution.[14] Indoor air pollution affects health, the household economy, child safety, and domestic hygiene, as well as the local and global environment.[15] Furthermore, the health impact of ambient pollution includes acute and chronic respiratory disease, lung cancer, myocardial infarction, and other conditions.[16] Air pollution is also a transnational environmental health concern, as illustrated by air pollution episodes, such as the forest fires in South East Asia.[17]

While use of chemicals is essential to meet the needs of humanity, many environmental and health problems are associated with chemical pollution of the environment.[18] Despite significant achievements in reducing the harm caused by chemicals, the production and industrial use of many suspected toxic chemicals continues unabated.[19] It is estimated that testing for toxicological properties on chemicals in commercial use occurs less than ten

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14. *See* WRI ET AL., *supra* note 9, at 1 (asserting that smoky indoor air caused mostly from cooking fires exposes millions of women and children to severe air pollution and contributes to acute respiratory infections); *see also* WHO, HEALTH FOR ALL, *supra* note 11, ¶ 25 (maintaining that indoor air pollution is one of the major causes of premature death in developing countries where there is little regulation of industrialization).

15. *See* WHO, HEALTH FOR ALL, *supra* note 11, ¶¶ 25-26 (asserting that air pollution is a global environmental hazard that can be detrimental to health, especially in unplanned industrialization, where practices like the inefficient use of energy affect the local environment).

16. *See* WHO, HEALTH AND ENVIRONMENT IN SUSTAINABLE DEVELOPMENT: FIVE YEARS AFTER THE EARTH SUMMIT 81, 87-88 (1997) (outlining that the effects of air pollution on health are varying and hard to estimate). However, experts believe that the number of deaths attributable to air pollution ranges from two to three million, and many of these deaths are caused by acute respiratory infections and other cardiovascular diseases. *Id.*

17. *See id.* at 85-86 (discussing the total global exposure to air pollution and noting that about three-fifths of the exposure takes place in rural regions of developing countries such as Southeast Asia).

18. *See* WHO, *supra* note 10, at 44-45 (discussing some of the negative effects of chemical pollution, using asbestos, lead, and arsenic as examples).

19. *See id.* at 44 (reporting on a growing body of evidence that various chemicals are dangerous to both humans and wildlife, with chemicals such as asbestos causing lung cancer and mesothelioma).

percent of the time.[20] Some chemicals, for example a number of organochlorine compounds and heavy metals, are highly persistent in the environment where they tend to bioacccumulate, and may disperse over large areas.[21] A number of semi-volatile organic chemicals have been transferred from their origins in low to mid latitudes to high and polar latitudes. Significant concentrations of chemical substances have been found in fish and other polar mammals eaten by humans.[22] Various chlorinated organic chemicals, butyl-tin and other compounds adversely affect the immune and reproductive systems of humans.[23] Other chemicals such as lead are known to be toxic to the brain, kidneys, and the reproductive and cardiovascular systems and may lead to renal and neuropathological damage.[24] Arsenic contaminates water and causes skin disorders, including cancer, reproductive health problems, and other neurological problems.[25]

Finally, climate change has had a negative effect on public health. Climate change causes variants in the "geographical range of disease organisms and vectors; the quantity of air, food, and water; and the stability of the ecosystems on which we depend."[26] The U.N.'s intergovernmental Panel on Climate Change and other scientific panels have assessed the potential health consequences of climate change.[27] Climate change has the potential to raise the incidence of

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20. *See id.* (explaining that while there is a current effort to make information about harmful chemicals available, human exposure to these materials has occurred for more than fifty years).

21. *See id.*

22. *See id.*

23. *See id.*

24. *See id.* at 44-45.

25. *See* WHO, *supra* note 10, at 45 (outlining the dangers of arsenic as an environmental health threat, which shares similar negative effects on human health as seen with lead).

26. WRI ET AL., *supra* note 9, at 67 (stating further that climate influences many health determinants and while substantial climate-related health effects are predicted for the future, making such predictions is an inexact science).

27. *See generally* WHO ET AL., *supra* note 13 (assessing and predicting the potential impacts of climate change on various infectious diseases). For more information specifically related to climate changes and heat waves, see NAT'L HEALTH ASSESSMENT GROUP, CLIMATE CHANGE AND HUMAN HEALTH (May

infectious diseases worldwide, including malaria, dengue fever, schistosomiasis, chagas disease, sleeping sickness, river blindness, and various strains of encephalitis.[28] Waterborne diseases such as cholera and diarrhoeal diseases caused by giardia, salmonella and cryptosporidium may also increase due to changing climate patterns.[29]

C. BEYOND ENVIRONMENTAL HEALTH: NATURAL RESOURCE CONSERVATION AND PUBLIC HEALTH

The management of natural resources is increasingly related to human health. This linkage ensures a balance between management of natural resources for their aesthetic benefits and sustainable development.[30] While the goal of natural resource management may focus on the protection of human wellbeing, it also benefits a sound ecological and intrinsic approach to natural resource protection. Human health and natural resource protection are not mutually exclusive because there is a relationship between environmental protection, human health, and economic development.[31] The conservation of forest, soil, and water resources is needed for the protection of human welfare, including health. Likewise, the protection of natural resources is increasingly dependent on the state

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2001) (stating that one of the direct impacts of climate change on human health has been an increase in the severity of heat waves, resulting in increased mortality rates due to heat stress). For example, in Chicago in 1995 heat stress killed 726 people during a four-day heat wave. *See* WRI ET AL., *supra* note 9, at 67.

28. *See* WHO ET AL., *supra* note 13, at 81-83, 93-94.

29. *See id.* at 96-100 (demonstrating the relationship between waterborne diseases that result from a reduction in water supply, and climate changes).

30. *See* Susan L. Smith, *Ecologically Sustainable Development: Integrating Economics, Ecology, and Law*, 31 WILLAMETTE L. REV. 261, 263-64, 287-88 (1995) (arguing that the management of natural resources must include a shift in global thinking to include the policy objectives of sustainable development, "integrating economic and environment concerns," while taking into account the aesthetic values that coincide with environmental protection because these are essential to preserving the quality of life for future generations).

31. *See* Sumudu Atapattu, *Sustainable Development and the Right to Health*, *in* SUSTAINABLE JUSTICE: RECONCILING ECONOMIC, SOCIAL AND ENVIRONMENTAL LAW 355, 355-56 (Marie-Claire Cordonier Segger & C.G. Weeramantry eds., 2005) (explaining that human beings and environmental protection are interrelated and sustainable development involves the convergence of several branches of law that work toward the protection of both health concerns and the environment).

of human health of populations in developing countries.[32] A linkage in this regard can be discerned with regard to the effect of disease on the conservation of natural resources.

Diseases negatively affect the conservation of natural resources in developing countries. The WHO Commission on Health and Macroeconomics states that disease retards economic well-being and development.[33] Malaria and AIDS have reduced the number of years of life expectancy. These diseases have resulted in early deaths and chronic disability that impact directly on natural resource conservation efforts in developing countries.[34] Experts conclude that diseases result in loss of well-being such as the reduction in incomes and reduction in longevity. For example, the high costs of malaria in Africa have been aptly demonstrated.[35] Malaria poses risks to the public, depresses tourism, blocks sustainable investments, and prevents the sustainable use of arable lands, forests, and other natural resources.[36] Tropical parasitic diseases such as onchocerciasis, schistosomiasis, and trypanosomiasis have rendered certain tropical areas uninhabitable or extremely unattractive for certain forms of

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32. *See id.* at 358 (discussing the linkage between a healthy environment, the protection of human life, and the right to health identified by the U.N. Committee on Economic, Social, and Cultural Rights).

33. *See generally* WHO CMH, *supra* note 3. For an example of one working paper discussed at the WHO's Commission on Health and Macroeconomics illustrating the affect disease has on natural resources, see JOHN LUKE GALLUP & JEFFERY D. SACHS, WHO CMH, THE ECONOMIC BURDEN OF MALARIA (2001).

34. *See* SUSAN ERSKINE, HEALTH ECONOMICS & HIV/AIDS RESEARCH DIVISION, RED RIBBONS AND GREEN ISSUES: HOW HIV/AIDS AFFECTS THE WAY WE CONSERVE OUR NATURAL ENVIRONMENT 2, 34-35 (2004), *available at* http://www.heard.org.za/research/USAID%20Environment%20report1.htm (follow "Intro I" hyperlink; and follow "Chapter 2" hyperlink to pdf files) (reporting the devastating effects of HIV/AIDS on sub-Saharan Africans and stating that healthy populations depend on healthy environments).

35. *See* Steve W. Lindsay & Martin Birley, *Rural Development and Malaria Control in Sub-Saharan Africa*, 1 ECOHEALTH 129, 129 (2004) (discussing the effects of malaria on rural development). *See generally* Vasant Narasimhan & Amir Attaran, *Roll Back Malaria? The Scarcity of International Aid for Malaria Control*, MALARIA J., Apr. 15, 2003, http://www.malariajournal.com/content/pdf/1475-2875-2-8.pdf (illustrating the desperate need for an increase in international funding for materials, research, and disease control for the malaria epidemic).

36. *See* Narasimhan & Attaran, *supra* note 35, at 1-2.

settlement, tourism, agriculture, mining and other natural resource management initiatives.[37]

An unprecedented public health threat, HIV/AIDS deserves particular consideration. According to the WHO and the Joint United Nations Program on AIDS ("UNAIDS"), HIV/AIDS has killed twenty million lives since its first occurrence.[38] HIV/AIDS prevalence has doubled since the early 1990s.[39] In 2003, sub-Saharan Africa had approximately two-thirds of the world's total AIDS population while Asia has an estimated 7.4 million people with HIV/AIDS.[40] UNAIDS has underscored the devastating impact of AIDS on the social, economic, and demographic underpinnings of development in developing countries.[41]

The impact of AIDS on natural resource conservation measures is also remarkable. AIDS is draining the natural resource conservation budgets of many countries in Africa south of Sahara. Conservation measures are being affected due to loss of highly-trained, skilled manpower and worker productivity due to absenteeism and lack of able-bodied labor.[42] The protection of forests and wildlife requires

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37. *See* WHO ET AL., *supra* note 13, at 93-95 (discussing the possible economic and environmental impact of incidences of various infectious diseases and the link to climate change); *see, e.g.*, B.S. Hursey & J. Slingenbergh, The Tsetse Fly and Its Effect on Agriculture in Sub-Saharan Africa, http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/v8180t/v8180t0s.htm (last visited Apr. 6, 2006).

38. *See* Joint U.N. Programme on HIV/AIDS [UNAIDS], *2004 Report on the Global AIDS Epidemic*, at 13, U.N. Doc. UNAIDS/04.16E (June 2004) (reporting the unprecedented impact of HIV/AIDS since its first diagnosis in 1981 and how few communities worldwide understood the extent of the crisis).

39. *See id.* at 24-25 (explaining the difficulties of calculating true estimates of how many people are living with HIV and AIDS, but showing that this number has dramatically increased since the early 1990s).

40. *See id.* at 189-207 (estimating that the number of people living with HIV at the end of 2003 to be approximately 37,800,000 million globally, with the majority in sub-Saharan Africa). UNAIDS also warns that despite recent efforts to combat disease, an even more gruesome public health disaster lies ahead, unless major and dramatic action is taken. *Id.* at 26.

41. *See id.* at 8, 26-29 (stressing that far from leveling off, the epidemic is on the rise in many countries in Sub-Saharan Africa and Asia, among others).

42. *See* WHO, *supra* note 10, at 25-27 (stating that disease is a barrier to economic growth in many developing countries where widespread epidemics can severely diminish the available workforce); *see also* Richards, *supra* note 1, at

skilled and healthy personnel. An important aspect of natural resource management has been community-based conservation activities. Furthermore, the increased budget for the care of the sick and orphaned and the loss of community leadership and morale undermines community participation in environmental protection. The role of communities as actors in environmental management is increasingly recognized in developing countries. In this regard, healthy populations are key in implementing a regime of effective community level environmental and natural resource management.[43]

D. ECOSYSTEMS AND PUBLIC HEALTH

Ecosystem and health focuses on the maintenance and restoration of the world's ecosystems as an essential determinant of human health and considers human health as one of the elements of sustainability. An ecosystem approach to the human health paradigm recognizes that human health is intimately tied not only to the health of ecosystems that sustain human life, but also to complex interactions between environmental, sociocultural, and economic factors.[44] However, this concept has its vulnerabilities, particularly in developing countries. Humankind in the developing world is facing situations of heightened vulnerability to disease.[45] This vulnerability extends to the relationship

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11299 (stating that disease has a negative impact on the efficiency of economic development, which in turn leads to an environmental impact).

43. *See* Lori M. Hunter et al., Population Dynamics and the Environment, Examining the Natural Resource Context of the African HIV/AIDS Pandemic 5-7 (July 2005) (working paper for the Biannual Meeting of International Union for the Scientific Study of Population), http://www.populationenvironmentresearch.org/papers/HunteretalIUSSP.pdf (discussing the breakdown of community management due to adult mortality rates attributed to diseases, such as HIV/AIDS, and the detrimental effects on natural resource use).

44. *See* Gilles Forget & Jean Lebel, *An Ecosystem Approach to Human Health*, INT'L J. OCCUP. & ENVTL. HEALTH (SUPPLEMENT), Apr.-June 2001, at S15-S16 (defining an ecosystem approach to human health as one that evaluates the sustainability of a particular ecosystem and the priority of human health and then manages the ecosystem in a way that is conducive to human, social, and economic needs).

45. *See id.* at S22-S25 (stating that the ecosystem approach necessitates cooperation and knowledge at the local level which is challenging in developing countries, especially those dealing with the hardships of disease); *see, e.g.*, WHO Press Release, *Avian Influenza – Situation (Birds) in Nigeria*, Feb. 8, 2006, http://www.who.int/csr/don/2006_02_08/en/ (warning of the recent geographical

between humans and wildlife. Accounting for this vulnerability are increases in population, travel, trade, and an unsustainable increase in utilization of natural resources.[46] In the wake of the severe acute respiratory syndrome ("SARS"), it is becoming apparent that trade in wildlife, even within the limitations imposed by the Convention on International Trade in Endangered Species of Flora and Fauna, poses a threat to public health.[47] Many new and re-emerging human diseases can be traced to pathogens that emanate from animals and products of animal origin.[48] The resurgence of Ebola in Central Africa,[49] the spread of avian flu in Asia and into Europe[50] and outbreaks of SARS in Asia,[51]

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spread of the highly pathogenic Avian Influenza); *see also* William Onzivu, *Globalism, Regionalism, or Both: Health Policy and Regional Economic Integration in Developing Countries, an Evolution of a Legal Regime?*," 15 MINN. J. INT'L L. 111, 115 (2006) (discussing the increasing need to place health on the global and regional agenda in light of recent disease outbreaks around the world).

46. *See* GLOBAL PUBLIC HEALTH: A NEW ERA 15-17 (Robert Beaglehole ed., 2003) (discussing the determinants of humankind's disruption to the environment in terms of its effect on freshwater, marine, and forest ecosystems).

47. *See* Mary C. Pearl, Editorial, *Wildlife Trade: Threat to Global Health*, 1 ECO HEALTH 111 (2004) (asserting that many wild exotic animals bring with them an enormous risk of diseases and parasites and yet despite regulations, the wildlife trade is approximately a six billion dollar activity).

48. *See id.* (arguing that the international community must reassess wildlife capture, transport, and the related enforcement of conventions in order to halt the spread of pathogens associated with these animals); *see also* FX Meslin et al., *Public Health Implications of Emerging Zoonoses*, SCIENTIFIC & TECHNICAL R., Apr. 2000, at 310, *available at* http://www.oie.int/eng/publicat/rt/1901/A_R19124.htm (explaining that wild animals act as hosts to these zoonoses and given the wide range of animals affected, it is difficult to control and eliminate many of these diseases).

49. *See* Ali S. Khan et al., *The Reemergence of Ebola Hemorrhagic Fever, Democratic Republic of the Congo, 1995*, 179 J. INFECTIOUS DISEASES (SUPPLEMENT) S76, S76-S85 (1999) (reporting details of a 1995 outbreak of ebola hemorrhagic fever in the Republic of Congo as the first outbreak after an eighteen year hiatus and the WHO response to the outbreak); *see also* Press Release, WHO Ebola Haemorrhagic Fever in the Republic of Congo (May 25, 2005), http://www.who.int/csr/don/2005_05_25/en/print.html.

50. *See* Jane Parry, *WHO Confirms Four Human Cases of Avian Flu in Indonesia*, BRIT. MED. J. (INT'L EDITION), Oct. 8, 2005, at 796 (reporting the human mortality from Avian Influenza in Indonesia and other Asian countries).

51. *See* WHO, THE WORLD HEALTH REPORT 2003, at 73-75 (2003) (tracking the origins of the SARS virus in Asia, beginning in the Guangdong province of China and subsequently spreading through Hong Kong and various international airports).

shows that diseases can be linked to wildlife.[52] These emerging infectious diseases are related directly to human intervention, via host or parasitic media.[53] In this connection for example, the avian flu and Ebola are believed to be spread by, inter alia, wild birds and monkeys respectively, which are also protected under international environmental law.[54] In Uganda, medical tests found transmission of scabies in both the famous mountain gorillas and the local populations in the southwest of the country. In sum, humans and wildlife in close contact can transmit diseases to each other necessitating the effective management of the health of both. Moreover, connecting the improvement of human health to wildlife conservation is a key to securing long-term commitment from local communities to protect wildlife. The implication of these linkages is to affirm the role of environmental law in the protection of public health, and that an ecosystem approach to health protection provides significant gains for both the public health and conservation. In this way, international environmental law complements other global public health instruments such as the Revised International Health Regulations in combating wildlife transmitted infectious disease epidemics.[55]

To conclude, international environmental law should bolster mechanisms to counter disease epidemics in developing countries. Health and environment linkages provide the grounds for use of environmental protection mechanisms for human health protection.

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52. *See, e.g.*, *Ebola Virus Confirmed as Cause of Outbreak*, 81 BULL. WORLD HEALTH ORG. 232 (2003) (reporting that dead gorillas tested positive for ebola in the Republic of Congo); *see also* Fiona Fleck, *Avian Flu Virus Could Evolve into Dangerous Human Pathogen, Experts Fear*, 82 BULL. WORLD HEALTH ORG. 236, 236-37 (2004) (stating that the "bird flu," or avian influenza, strain could mutate into a human pathogen and is spread by populations of migratory birds).

53. *See* Peter Daszak et al., *Emerging Infectious Diseases of Wildlife—Threats to Biodiversity and Human Health*, 287 SCIENCE 443, 443, 446 (2000) (explaining the transmission of a pathogenic infectious disease from a host animal to either wildlife or domestic animals and finally human populations, and asserting that this continuum is formed when humans translocate or introduce animals to new geographic regions).

54. *See generally* M.J. Bowman, *International Treaties and the Global Protection of Birds: Part II*, 11 J. ENVTL. L. 281 (1999) (discussing the international environmental legal regimes for the protection of birds).

55. *See generally International Health Regulations*, WHO, Fifty-Eighth World Health Assembly, Comm. A, 3d Rep., WHO Doc. A58/55 (May 23, 2005).

II. HEALTH AND THE DEVELOPMENT OF INTERNATIONAL ENVIRONMENTAL LAW

International environmental law is progressively a tool of global public health protection. The major sources of international environmental law include treaties, international custom, general principles of law, and subsidiary sources such as decisions of courts and tribunals and the writings of jurists.[56] However, treaties are the major source of international law for the environment.[57] A number of principles emerged from the 1992 U.N. Conference on Environment and Development ("UNCED"), other declarations, and the ensuing conventions, and have supported the development of international environmental law.[58] These principles include the concept of sustainable development,[59] the principle of intergenerational equity[60]

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56. *See* PATRICIA W. BIRNIE & ALAN E. BOYLE, INTERNATIONAL LAW AND THE ENVIRONMENT 9-31 (1st ed. 1992) (discussing in detail the sources of international environmental law); *see also* Statute of the International Court of Justice art. 38(1), June 26, 1945, 59 Stat. 1055, 1060, 3 Bevans 1153, 1187 [hereinafter ICJ Statute] (stating the different sources of international law of which international environmental law is a part).

57. *See* PHILIPPE SANDS, PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW 104-06 (1995). The number of environmental treaties has increased each decade since the 1950s. *Id.*

58. *See* VED P. NANDA & GEORGE (ROCK) PRING, INTERNATIONAL ENVIRONMENTAL LAW FOR THE 21ST CENTURY 17-62 (2003) (stating that several environmental principles emerged including the duty to cooperate, the duty not to cause harm outside a nation's borders, sustainable development, and the right to a clean environment, environmental justice, and equitable distribution of resources).

59. *See* Report of the United Nations Conference on Environment and Development, June 3-14, 1992, *Rio Declaration on Environment and Development*, Annex I princ. 4, U.N. Doc A/CONF.151/26 (Vol. I) (1992) [hereinafter *Rio Declaration*] (declaring that environmental protection constitutes an integral aspect of sustainable development).

60. Several of the Principles from the Rio Declarations support an intergenerational model of development. *See id.* princ. 3 (asserting that an equitable right to development is essential to fulfill the needs of present and future generations); *id.* princs. 5-7 (urging all people and nations to cooperate in a global partnership to eradicate poverty, assist vulnerable populations, and reduce environmental degradation); *see also id.* princ. 11 (urging states to enact effective and appropriate environmental laws and programs); *id.* princ. 14 (calling for states to prevent the transfer of harmful material to other states).

and intragenerational equity,[61] the right to a clean environment,[62] the polluter-pays principle,[63] the precautionary principle,[64] and the practice of environmental impact assessments.[65]

The 1972 United Nations Conference on Human Environment held in Stockholm noted the continuing impairment of the environment and spearheaded the move toward more intensified international action based on the recognition of the health dimension of environmental issues.[66] In this regard, the Stockholm Declaration provided for quality human environment and protection of human health in the context of marine environments.[67] While the conference did not set a specific health agenda, it laid the groundwork for health

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61. *See id.* princ. 21 (urging younger generations to form a creative global partnership in support of sustainable development).

62. *See id.* princ. 1 (pronouncing that under a sustainable development model all people are entitled to a healthy environment); *see also* United Nations Conference on the Human Environment, June 5-16, 1972, *Declaration of the United Nations Conference on the Human Environment*, princ. 1, U.N. Doc. A/CONF.48/14/Rev. 1 (1973) [hereinafter *Stockholm Declaration*] (declaring that all persons have a fundamental right to equal and adequate environmental conditions).

63. *See Rio Declaration*, *supra* note 59, princ. 16 (stating that a pollutor should bear the cost of pollution unless such an action would impede international trade or investment); *see also* United Nations Conference on Environment and Development, June 3-14, 1992, *Agenda 21 Programme of Action for Sustainable Development*, ¶ 8.28, U.N. Doc. A/CONF.151/26 (1992) [hereinafter *Agenda 21*] (reporting that several countries have moved toward market-oriented approaches such as having the polluter or natural resource-user pay).

64. *See Rio Declaration*, *supra* note 59, princ. 15 (urging states to adopt precautionary measures to protect the environment); *see also Agenda 21*, *supra* note 63, ¶¶ 9.6-.8 (listing serveral precautionary actions that states can take to protect the environment such as increased research, balanced climate observation, scientific capacity building, and identification of climate fluctuations).

65. *See Rio Declaration*, *supra* note 59, princ. 17 (encouraging states to craft a policy of national environmental impact statements that note activities likely to adversely affect the environment).

66. *Stockholm Declaration*, *supra* note 62, pmbl. (discussing the magnitude of human-made problems in the environment that have adverse effects on physical, mental, and social health).

67. *Id.* princ. 1 (declaring that each person has the fundamental right to a quality environment). Furthermore, states have an obligation to prevent pollution that is hazardous to human health. *Id.* princ. 7.

within the environmental agenda.[68] The Montevideo Programme for the Development and Periodic Review of Environmental Law was prepared in 1981.[69] It was adopted by the UNEP Governing Council in 1982, and it influenced UNEP's legal activities between 1982 and 1992.[70] The program made proposals for the development of international environmental law in three categories: (1) international agreements; (2) international principles and guidelines; and (3) the provision of international assistance.[71] Even though health concerns had been a key driving force behind the resulting treaties, health did not feature prominently in the ensuing environmental protection agenda.[72]

Following the work of the World Commission on Environment and Development (Brundtland Commission) and its report, *Our Common Future*, in 1992 the U.N. Conference on Environment and Development took place. The Report of the World Commission on

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68. The Conference adopted three non-binding instruments, a resolution on institutional and financial arrangements, the Stockholm Declaration containing twenty-six principles, and an action plan containing 109 recommendations. *See generally id.* (providing the complete outcome of the Stockholm Declaration including the full text of the various non-binding instruments, principles, and recommendations).

69. *See generally* UNEP, *Report of the Ad Hoc Meeting of Senior Government Officials Expert in Environmental Law*, Annex, U.N. Doc. UNEP/GC.10/5/Add.2 (Dec. 7, 1981) (recommending that States and organizations develop programs that harmonize development and the environment in the areas of marine pollution, ozone depletion, and the handling of toxic waste).

70. *See* UNEP, *Environmental Law*, Annex 1, U.N. Doc. UNEP/CG.10/21 (1982) (adopting the recommendations of the Montevideo Programme). Moreover, the decision of the governing council calls upon states and international organizations to cooperate in the development and implementation of environmental law. *Id.*

71. *See* BIRNIE & BOYLE, *supra* note 56, at 49 (stating the broad categories of environmental law and noting that while these categories overlap, the UNEP has made considerable progress in each of these areas).

72. The detailed areas targeted for work included international cooperation in environmental emergencies, coastal zone management, soil conservation, trans-boundary air pollution, international trade in potentially harmful chemicals, protection of rivers and other inland waters against pollution, legal and administrative measures for the prevention and redress of pollution damage, and environmental impact assessments. *See id.* at 48-53.

Environment and Development[73] and UNCED in Rio de Janeiro[74] led to, inter alia, the adoption of Agenda 21.[75] Principle 1 of the Rio Declaration on Environment and Development states that "Human beings are at the centre of concerns for sustainable development . . . entitled to a healthy and productive life in harmony with nature."[76] Commentators have stated that the Declaration embodies a strong anthropocentric and utilitarian approach devoid of references to any component of the environment having an intrinsic view.[77] However, in my view, the Declaration laid down a sound foundation for the protection of public health in the realm of a global environmental agenda.[78]

One resulting instrument, Agenda 21, provided for the need to protect and promote human health, with emphasis on meeting primary health care needs—particularly in rural areas—control of communicable diseases, the protection of the health of vulnerable groups, addressing the urban health challenge, and reducing health risks from environmental pollution and hazards.[79] By emphasizing the need for preventive efforts for health and sustainable development, Agenda 21 provided a mandate for WHO and other health actors to promote health through, inter-alia, international environmental law. Agenda 21 and the Rio Declaration set the basis

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73. Report of the World Commission on Environment and Development, G.A. Res. 42/187, U.N. GAOR, U.N. Doc. A/RES/42/187 (Dec. 11, 1987).

74. *Rio Declaration*, *supra* note 59.

75. *Agenda 21*, *supra* note 63.

76. *Rio Declaration*, *supra* note 59, princ. 1.

77. *See* ALEXANDRE KISS & DINAH SHELTON, INTERNATIONAL ENVIRONMENTAL LAW 5 (Supp. 1994).

78. *See, e.g.*, *Rio Declaration*, *supra* note 59, pmbl. (showing how the Rio Declaration recognizes the integral and interdependent nature of the earth). However, Principle 1 affirms that human beings are a central concern for sustainable development. *Id.* princ. 1. In my view, while the anthropocentric approach features prominently, the preamble contains an eco-centric approach despite the fact that the legal value of a preamble is lower.

79. *Agenda 21*, *supra* note 63, ¶¶ 6.1-6.46. *See generally* Yasmin von Schirnding, *Health in the Context of Agenda 21 and Sustainable Development: Meeting the Challenges of the 21st Century*, 3 SUSTAINABLE DEV. INT'L 171 (2001).

for integration of health in sustainable development,[80] affirming that sustainable development maximizes human potential while protecting the environment but that if there is a conflict, human welfare must prevail.[81] This principle has created tensions with environmental advocates.[82]

A key contribution of Agenda 21 to the environment-health discourse has been to expand on the narrow attention devoted to the environment as a source of disease to a wider inclusion of medical care, preventive medicine, and the general improvement of human health. In this way, Agenda 21 reflects the WHO definition of health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."[83] In the developing nations, health is essential for development.[84] Disease pandemics such as malaria and HIV/AIDS have undermined environmental

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80. *See Agenda 21*, *supra* note 63, ¶ 9.9 (noting that States should use energy sources in a manner that respects both human health and the environment).

81. *See Rio Declaration*, *supra* note 59, princ. 1 (declaring that humans are the central concern of sustainable development).

82. *See* KISS & SHELTON, *supra* note 77, at 5 (criticizing the Rio Declaration as being strongly anthropocentric and overly utilitarian in its approach to the environment); *see also* John Ntambirweki, *The Developing Countries in the Evolution of an International Environmental Law*, 14 HASTINGS INT'L & COMP. L. REV. 905, 905-28 (1991) (assessing the contribution of third world countries to the evolution of international environmental law, emphasizing the failure of these nations to engage in activism in light of the fact that their environmental problems are lethal); Alhaji B.M. Marong, *From Rio to Johannesburg: Reflections on the Role of International Legal Norms in Sustainable Development*, 16 GEO. INT'L ENVTL. L. REV. 21, 32 (2003) (emphasizing that at the Stockholm and Rio Conferences, negotiations proceeded from a North/South perspective, with developed countries advocating strict environmental commitments, and developing countries emphasizing that environmental commitments must not effectively stall their economic development and poverty alleviation objectives).

83. Constitution of the World Health Organization, July 22, 1946, 62 Stat. 2679, 14 U.N.T.S. 185 [hereinafter WHO Const.].

84. *See* WHO, *supra* note 2, at 1-12 (finding that poor health conditions increase poverty and that persons with better health contribute to economic growth). Furthermore, research indicates that health indicators such as life expectancy and survival rates are predictors of economic development. *Id.* Good health also contributes to development because increased health allows demographic transitions that reduce dependency on states. *Id.*

protection and development in developing countries.[85] Furthermore, Agenda 21 expounds on the importance of distributive justice and equality in access to basic goods and services as a component of sustainable development. Public health concerned with the health of the population as a whole is also concomitant with the concept of redistributive justice in the provision of health services and equitable access to medical care.[86] Some commentators contend that with over 2500 actions in 150 program areas, Agenda 21 did not provide explicit priority for future work. However, its emphasis on enhancing the links between poverty reduction, economic efficiency and sound environmental management is implied.[87] Agenda 21 strengthens the importance of international health cooperation in dealing with existing and emerging disease pandemics, particularly in developing countries. Agenda 21 thus provides an important basis for the promotion of environmental health through the application of international environmental law at both the global and national spheres.[88]

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85. *See id.* at 49 (stating that malaria is actually a cause rather than a consequence of underdevelopment). For example, estimates indicate that Kenya spends between two and six percent of its GDP on malaria treatment. *Id.*

86. *See* Frank P. Grad, *Public Health Law: Its Form, Function, Future, and Ethical Parameters*, 49 INT'L DIGEST HEALTH LEGIS. 19, 19-22 (1998) (defining public health law as the plethora of legislation having little in common but the goal of promoting public health); *see also* William Onzivu, *Public Health and the Tobacco Problem: International Legal Implications for Africa*, 29 GA. J. INT'L & COMP. L. 223, 225 (2001) (discussing the redistributive role of public health).

87. *See* NANDA & PRING, *supra* note 58, at 103 (arguing that the effectiveness with which Agenda 21 is actually funded and implemented will determine whether this ambitious document is successful).

88. *See Agenda 21*, *supra* note 63, ¶ 1.3 (explaining that cooperation among states, international organizations, and various regional organizations should support national environment strategies); *id.* at ¶ 2.1 (establishing a global partnership that commits all states involved to continuous and constructive dialogue); *see also* Yasmin von Schirnding et al., *International Environmental Law and Global Public Health* 80 BULL. WORLD HEALTH ORG. 970, 970 (2002), *available at* http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S0042-96862002001200012&lng=en&nrm=iso (discussing how Agenda 21 has played a part in creating a platform for WHO to promote health through international environmental law); YASMIN VON SCHIRNDING, THE WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT: REAFFIRMING THE CENTRALITY OF HEALTH, GLOBALIZATION & HEALTH 1, 1 (May 10, 2005), http://www.globalizationandhealth.com/content/pdf/1744-8603-1-8.pdf (stating that Agenda 21

It is therefore not surprising that during the World Summit on Sustainable Development in 2002, health was one of the five key priorities of the Summit.[89] In the Summit's Plan of Implementation, the Parties agreed to a number of health-related goals enshrined in the Millennium Goals.[90] These included the importance of reducing infant/child mortality rates by two-thirds by 2015,[91] a similar two-thirds reduction for maternal mortality rates by two-thirds by 2015,[92] and the enhancement of global health literacy by 2010.[93] Parties were called upon "to reduce respiratory diseases and other health impacts resulting from air pollution."[94] The Parties also agreed to targets on chemicals management, calling for the significant reduction of the adverse effects of chemicals to human health and the environment by 2020.[95] The Summit also reaffirmed the commitment to provide sufficient resources to support the United Nations Global Fund to Fight AIDS, Tuberculosis, and Malaria.[96] However, no additional

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"emphasized the fundamental commitment within sustainable development to 'protecting and promoting human health'").

89. *See* NANDA & PRING, *supra* note 58, at 116 (listing the major commitments of the Summit which include water and sanitation, energy, health, agriculture, and biodiversity); *see also* VON SCHIRNDING, *supra* note 88, at 4.

90. *See* U.N. DEPARTMENT OF ECONOMIC & SOCIAL AFFAIRS, DIVISION FOR SUSTAINABLE DEVELOPMENT, PLAN OF IMPLEMENTATION OF THE WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT 1 (2002), http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf (affirming the commitment to the Rio principles, Agenda 21, the development goals of the Millennium Declaration, and other U.N. conferences and agreements).

91. *Id.* at 4 (encouraging states to increase access to sanitation and clean water in order to improve health problems and, thereby, reduce infant mortality).

92. *Id.* at 32 (ensuring equal access to health care for women, particularly those who require maternal or obstetric care).

93. *Id.* at 32 (promoting health literacy with the help of the United Nations).

94. *Id.* at 33 (suggesting that possible ways to reduce air pollution include strengthening regional programs, phasing out gasoline, reducing emissions, and providing affordable energy to reduce fuel dependence).

95. *Id.* at 13 (urging States to properly manage chemicals and hazardous wastes through precautionary measures such as the use of risk assesment and managment procedures in order to mitigate adverse effects on human health and the environment).

96. *Id.* (recommending that States implement prevention and treatment strategies, provide sufficient resources to the Global Fund to Fight AIDS,

funding was committed.[97] There were discussions on the role of human rights and fundamental freedoms in the provision of healthcare and preventive health services, recognizing that health is a key aspect of sustainable development.[98] However, the Summit added nothing substantially innovative, such as reinforcing the social pillar of environmental law and policymaking as additional to the prevailing environmental and economic pillars in environmental management.[99] It also strengthened the importance of partnerships in advancing sustainable development but failed to refine and strengthen the existing international legal and institutional frameworks for sustainable development.[100] The Summit did not advance cross-sectoral principles such as "the precautionary principle, the principle of common but differentiated responsibilities of countries and the polluter pays principle" in the context of health.[101] As one commentator put it, "As an implementation-focused Summit, Johannesburg did not produce a particularly dramatic outcome—there were no agreements that will lead to new treaties and many of the agreed targets were derived from a panoply of assorted lower profile meetings."[102]

Tuberculosis and Malaria, increase workplace health standards, and encourage research and development).

97. *See* NANDA & PRING, *supra* note 58, at 113 (explaining that most of the funding would be distributed from existing programs).

98. *See* Gray, *supra* note 5, at 256 (discussing the disagreement between various countries regarding the capacity of healthcare systems to deliver basic health services consistent with national laws, and cultural and religious values).

99. *See* Katharina Kummer Peiry, Editorial, *Public Health in International Law: The Contribution of the World Summit on Sustainable Development*, 80 BULL. WORLD HEALTH ORG. 925, 925 (2002) (noting that the Summit's goal was not to produce a legally binding treaty and that, in fact, the results of the Summit fell short of providing a meaningful political contribution).

100. *See* Carl Bruch & John Pendergrass, *Type II Partnerships, International Law, and the Commons*, 15 GEO. INT'L ENVTL. L. REV. 855, 886 (2003) (concluding that despite the active participation of the private sector, to avert a tragedy of the commons all nations should demonstrate an international commitment to sustainable development).

101. *See* Peiry, *supra* note 99, at 925 (noting that these principles have been developed as environmental protections and should expand to the health context).

102. NANDA & PRING, *supra* note 58, at 119 (providing an assessment of the Summit from a U.N. sponsor who concluded that though there was no dramatic

Despite these shortcomings, the Summit has made a contribution to the protection of public health by affirming the central role of health in sustainable development.[103] While international environmental law also aims to protect health, the following discussion will reveal that this potential has not been fully realized either globally or domestically, especially by the prominent health actors.[104] Multilateral environmental initiatives seem to lack a comprehensive follow-up for public health promotion.

III. INTERNATIONAL ENVIRONMENTAL LAW AND HEALTH: CASE STUDIES

A. INTRODUCTION

In order to position public health in the realm of environmental protection, it is important to examine selected environmental conventions. While there are several environmental conventions that protect health,[105] I have focused on the Rotterdam Convention on the

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outcome, the Summit did lead to the realization that practical solutions are necessary to fight poverty).

103. *See* VON SCHIRNDING, *supra* note 88, at 5 (adding that the Summit recommended that "governments immediately enact and enforce clear and effective laws that support sustainable development, develop and strengthen the necessary infrastructure, and promote public participation in implementation at the local, national, and regional levels").

104. The international community's neglect to promote the potential of international environmental law for the benefit of public health is symptomatic of the neglect of international law generally by global health actors such as the WHO and Member States. *See generally* Katarina Tomasevski, *Health*, *in* 2 UNITED NATIONS LEGAL ORDER 859 (Oscar Scachter & Christopher C. Joyner eds.,1995) (providing some early discussions about this neglect); David P. Fidler, *The Future of the World Health Organization: What Role for International Law?*, 31 VAND. J. TRANSNAT'L L. 1079 (1998) (describing how the WHO has traditionally ignored international law and concluding that the organization should develop an understanding of the relationship between international law and global health issues); Fiona Godlee, *WHO in Retreat: Is it Losing Its Influence?*, 309 BRIT. MED. J. 1491 (1994) (decrying the WHO's attachment to the medical model since its inception); Lynn Eaton, *WHO Lacks Teeth on International Health Issues, Says Professor*, 327 BRIT. MED. J. 1070 (2003) (attributing the WHO's limitations to Member States' reluctance to give the agency the necessary authority to address global health concerns).

105. *See, e.g.*, Framework Convention on Climate Change art. 4, May 9, 1992, S. TREATY DOC. NO. 102-38, 1771 U.N.T.S. 107 [hereinafter Framework

Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade,[106] the Stockholm Convention on Persistent Organic Pollutants[107] and the two multilateral Ozone Treaties.[108] These treaties, while aiming to preserve the environment, also serve to protect health.[109] However, to understand whether international environmental law is in fact public health law, it is important to consider firstly the health-related provisions of the treaties. Secondly, it is also essential to consider the implementation and enforcement mechanisms of these treaties relative to health.

Convention]; Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22 (1998); Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 28 I.L.M. 657 (1989) [hereinafter Basel Convention].

106. Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, Sept. 11, 1998, 38 I.L.M. 1 (1999) [hereinafter Rotterdam Convention].

107. Stockholm Convention on Persistent Organic Pollutants, May 22, 2001, 40 I.L.M. 532 (2001) [hereinafter Stockholm Convention].

108. Vienna Convention for the Protection of the Ozone Layer, Mar. 22, 1985, T.I.A.S. No. 11,097, 1513 U.N.T.S. 293 [hereinafter Vienna Convention]; Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, S. TREATY DOC. NO. 100-10, 1522 U.N.T.S. 29. For a full text of the Montreal Protocol, incorporating all amendments and adjustments, see OZONE SECRETARIAT, UNEP, THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER (2000), http://www.unep.ch/ozone/pdf/Montreal-Protocol2000.pdf [hereinafter Montreal Protocol].

109. The area of international environmental law, comprising of substantive, procedural, and institutional rules of international law that primarily aim to protect the environment, continues to evolve. *See, e.g.*, Convention on Environmental Impact Assessment in a Transboundary Context art. 1(vii), Feb. 25, 1991, 30 I.L.M. 800 (1991) (providing early legal definitions that incorporated references to human health in the context of environmentally significant activity); Convention on the Protection and Use of Transboundary Watercourses and International Lakes art. 1(2), Mar. 17, 1992, 1936 U.N.T.S. 269 (defining "environment" to include human health and safety, flora, fauna, soil, air, water, climate, landscape, historical monuments or other physical structures, or any interaction among these factors); *see also* SANDS, *supra* note 57, at 17-19 (noting the importance of the legal definitions of the environment and related concepts).

B. THE CONVENTION ON THE PRIOR INFORMED CONSENT PROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE

In the past decades, pesticide poisoning in the developing world has increased enormously posing a challenge to the protection of global public health.[110] Although ninety percent of all chemicals are produced in developed countries, developing countries have significantly higher rates of pesticide poisoning and account for a high number of pesticide deaths.[111] Environmental damage due to pesticide use has led to water contamination with devastating impact on public health.[112] Banned or severely restricted pesticides continue to be used in developing countries. These chemicals include DDT, DBCP, and Phosvel, all implicated in adversely affecting human health.[113] Despite many States' recognition of pesticide-related public health threats, national legal and regulatory mechanisms in countries had been *ad hoc* or ineffective.[114] Therefore, the development of an

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110. *See* WHO, OUR PLANET OUR HEALTH: REPORT OF THE WHO COMMISSION ON HEALTH AND ENVIRONMENT 79 (1992) (observing that States underestimate the health impacts of the global use of agricultural chemicals).

111. *See* BARBARA DINHAM, THE PESTICIDE HAZARD: A GLOBAL HEALTH AND ENVIRONMENTAL AUDIT 49 (1993) (noting that cancer death rates are greater in areas where pesticides are widely used); *see also* Charlotte Uram, *International Regulation of the Sale and Use of Pesticides*, 10 NW. J. INT'L L. & BUS. 460, 469 (1990) (summarizing the nature of environmental controls in industrialized countries, which result in proportionately greater rates of pesticide poisonings in developing nations).

112. *See* WHO, *supra* note 110, at 100 (arguing that governments should develop comprehensive water policies incorporating health promotion and balancing agricultural concerns).

113. *See* WRI ET AL., *supra* note 9, at 42-46 (specifying the global health risks created by use of pesticides around the world); *see also* Nancy S. Zahedi, Note, *Implementing the Rotterdam Convention: The Challenges of Transforming Aspirational Goals into Effective Controls on Hazardous Pesticide Exports to Developing Countries*, 11 GEO. INT'L ENVTL. L. REV. 707, 708-09 (1999) (identifying several pesticides both banned by and exported from the industrialized world as chemicals creating human health and environmental problems in developing countries).

114. *See, e.g.*, Jane A. Dwasi, *Regulation of Pesticides in Developing Countries*, 35 ENVTL. L. REP. 10045, 10045 (2002) (arguing that existing laws in Kenya have not adequately protected health or the environment from the adverse effects of pesticides); *see also* Heather M. VanDorn, *The Rotterdam Convention*, 1998 COLO. J. INT'L ENVTL. L. & POL'Y, 1998 Y.B. 281, 282 (1999) (affirming that the

international legal instrument became imperative. The Rotterdam Convention regulates international trade in chemicals by allowing Parties to decide which chemicals and pesticides to import or exclude.[115] The treaty requires labelling and information exchange by exporters to importers regarding the potential risks associated with such chemicals. The treaty aims to promote the safe use of chemicals at the national level, particularly in developing countries and limit the harm that may result from international trade in chemicals.[116]

The Rotterdam Convention requires States parties to ban or severely restrict pesticides based on the exchange of relevant information.[117] Pesticides listed in Annex III are subject to the PIC provisions and can only be exported to an importing country with that country's prior consent, unless they meet some listed exceptions.[118] The list includes twenty-two pesticides such as aldrin, DDT, captafol, chlorobenzilate, cholordane, dinoseb, and lindane. It also includes five industrial chemicals such as crocidolite, polybrominated biphenyls ("PBB"), polychlorinated biphenyls ("PCB").[119] Importing countries that refuse imports of PIC-listed pesticides and chemicals must also simultaneously prohibit imports from all sources as well as its domestic production for domestic use.[120] Banned or severely restricted pesticides in a country, but not listed in Annex III, are subject to the notification provisions of the

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Rotterdam Convention was a legal response to the inability of governments to monitor and manage the many potentially dangerous substances crossing their borders).

115. *See* Rotterdam Convention, *supra* note 106, art. 1, 38 I.L.M. at 2 (stating that the objective of the Convention is to promote shared responsibility and cooperative efforts to protect human health and the environment from harm potentially caused by the international trade of hazardous chemicals).

116. *Id.*

117. *Id.* art. 14, 38 I.L.M. at 10 (noting the procedures, duties, and limitations on information exchange between the Parties concerning chemicals that fall within the scope of the Convention).

118. *Id.* art. 11, 38 I.L.M. at 8 (discussing the obligations of Parties exporting chemicals that fall under the scope of the Convention).

119. *Id.* Annex III, 38 I.L.M. at 20 (listing fully the chemicals subject to the prior informed consent procedure under the Convention).

120. *Id.* art. 10(9), 38 I.L.M. at 7.

Convention.[121] An exporting country must inform the importing country of exports of banned or severely restricted pesticides at the time of first export and annually thereafter.[122] Furthermore, severely hazardous pesticide formulations can be subject to regulation under the Convention.[123]

In order for a banned or severely restricted chemical to be included in the PIC procedure, the party banning or severely restricting the chemical must notify the Secretariat.[124] The Secretariat then forwards the notification to an expert body created by the Convention, the Chemical Review Committee. Based on defined criteria, the Committee reviews the information and refers its conclusions to the Conference of Parties as to whether the chemical in question should be listed in Annex III.[125] It is eventually incumbent upon parties to decide whether to consent or decline any restrictions placed on the trade in a chemical.[126]

The Rotterdam Convention also prohibits the use of the Convention as a trade barrier.[127] It includes procedures for removing chemicals from the list in Annex III after proof by a party that the listing is no longer justified.[128] Parties must comply with export

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121. *Id.* art. 12, 38 I.L.M. at 8-9 (specifying the notification procedures and actions that the Convention requires of both importing and exporting Parties).

122. *Id.*

123. *Id.* art. 3, 38 I.L.M. at 3 (discussing the scope of the Convention, which applies to both banned or severely restricted chemicals and severely hazardous pesticide formulations).

124. *Id.* art. 5, 38 I.L.M. at 4 (indicating the notification, publication, and recommendation procedures for banned or severely restricted chemicals).

125. *Id.*

126. *See id.* (limiting the Chemical Review Committee's role to merely recommending whether or not to ultimately place chemicals on the restricted list); *see also id.* art. 18, 38 I.L.M. at 11-12 (reflecting the structure and functions of the Conference of Parties, including considering and ultimately undertaking the actions necessary for the implementation of the Convention).

127. Any party that decides not to consent to importation or consents only under specified conditions must "prohibit or make subject to the same conditions: import of the chemical from any source; and national production of the chemical for domestic use." *Id.* art. 10(9), 38 I.L.M. at 7.

128. *Id.* art. 9, 38 I.L.M. at 6 (noting the submission and analysis requirements imposed upon Parties, the Secretariat, the Chemical Review Committee, and the Conference of the Parties by the Convention).

notifications as well as information and labelling requirements relating to listed chemicals. Furthermore, Parties are also encouraged to provide technical and financial support for capacity building for developing countries.[129]

The Rotterdam Convention is a classic example of the linkage between an environmental treaty and global public health protection. First, the objective of the Convention impresses on the need to protect health.[130] It states that the objective of the Convention is to "promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm."[131]

Health is included in the definitions of banned chemical and severely hazardous pesticide formulation.[132] A severely hazardous pesticide formulation is defined as "a chemical formulated for pesticidal use that produces severe health or environmental effects observable within a short period of time after single or multiple exposure, under conditions of use."[133] According to this definition, severely hazardous pesticide formulations include only those pesticides that cause acute effects, not longer term effects. This has some shortcomings because pesticides may result in longer term health problems. Furthermore, a banned chemical is defined as a pesticide for which all registered uses have been prohibited by final government regulatory action, or for which all requests for registration or equivalent action for all uses have, for health or environmental reasons not been granted.[134] In this connection, regulation of pesticides serves as a public health tool. In regulating chemicals, the Convention requires clear evidence that the pesticides are harmful to human health.[135] The health sector has a central role to

129. *Id.* art. 16, 38 I.L.M. at 11.

130. The Convention has over twenty references to health throughout its text, showing that health is a major objective for the working and implementation of the treaty.

131. *Id.* art. 1, 38 I.L.M. at 2.

132. *Id.* art. 2, 38 I.L.M. at 2.

133. *Id.* art. 2(d), 38 I.L.M. at 2.

134. *Id.* art. 2(b), 38 I.L.M. at 2.

135. *Id.* (introducing a requirement of clear evidence to show that actions to prohibit or ban chemicals have been taken in order to protect human health or the

play in providing the evidence. Prohibition of the registered uses of a pesticide by governmental regulation is one sufficient proof to ban the pesticide under the Convention.[136] By providing other criteria to ban pesticides, the Rotterdam Convention provides less noticed but a wider framework to promote health.

Health standards are also applied by the Chemicals Review Committee to determine whether a chemical should be listed in Annex III or not.[137] The criteria used to make the decision includes whether the action of the party was taken to protect the environment or human health, whether the party conducted a risk evaluation based on scientific data, and whether there is a sufficiently broad basis to merit listing of the chemical in Annex III. In this regard, to decide whether such a sufficiently broad basis exists, the Chemical Review Committee must take into account whether the listing of the chemical would lead to a large decrease in the quantity of the chemical used or the number of its uses, whether the listing would lead to a reduction in risk for human health or the environment, geographical factors and that international trade in the chemical is occurring.[138]

While the Convention should be commended for containing such wide ranging provisions to protect public health, it is bound to have challenges relating to implementation in developing countries.[139] Health as a criterion is ambiguously paired up with the environment, risk evaluation, and international trade. It would appear that a criteria based solely on health would be inadequate to ban or restrict a chemical. The precautionary principle relating to health finds no

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environment); *see also id.* Annex II, 38 I.L.M. at 18-19 (providing criteria for the Chemical Review Committee to determine whether or not to recommend listing a chemical as banned or severely restricted under the Convention, including confirmation that the final regulatory action was taken to protect human health or the environment).

136. *Id.* Annex II, 38 I.L.M. at 19 (reviewing the standards by which the Chemical Review Committee must analyze final regulatory actions and authorizing the Committee to list the chemical as banned or severely restricted under the Convention if the regulatory action meets the established criteria).

137. *Id.*

138. *Id.*

139. *See* Dwasi, *supra* note 114, at 10060 (stating that while the Rotterdam Convention may have a robust mechanism to deal with non-compliance, many developing countries have lacked the required legal and institutional infrastructure to implement the Convention).

ground in the Convention.[140] These weaknesses undermine the role of the Convention in regulating chemicals to promote public health.

Furthermore, the impact of the Rotterdam Convention for health promotion in developing countries is unclear. There is no clear mechanism for financial assistance for developing countries.[141] Many of the national legal and regulatory mechanisms that assess whether a chemical is hazardous to health may be inadequate.[142] The identification and evaluation of a chemical before its listing under the Convention may be a challenge because many developing countries lack the technical capability to undertake such actions.[143] Compliance by developed countries and some developing countries regarding labelling, notifications, information exchange, etc., has been poor.[144]

With such weaknesses, the potential impact of the PIC to protect public health is yet to be seen. The Convention could support public health by mobilizing technological transfers to developing countries that can ultimately reduce pesticide related death and disease. However, by contributing to the reduction of harm caused by pesticide pollution, the Rotterdam Convention is an example of the role international environmental law can play in the promotion of public health.

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140. *See* Zahedi, *supra* note 113, at 735-37 (arguing that a regulatory system premised on the precautionary principle would be more effective and more easily implemented than the Rotterdam Convention system, which requires developing countries to dedicate personnel and resources to this issue in the face of competing priorities).

141. *See* Rotterdam Convention, *supra* note 106, art. 16, 38 I.L.M. at 11 (requiring States parties to cooperate in the technical assistance provision, particularly for developing countries).

142. *See* Dwasi, *supra* note 114, at 10060 (identifying requirements for successful implementation of the Rotterdam Convention, including the effective domestic regulatory mechanisms that developing countries continue to lack).

143. *Id.*

144. *See* Zahedi, *supra* note 113, at 739 (arguing that the Rotterdam Convention is only a partial solution to the problem of hazardous pesticides because of its deficiency in several areas and that the effectiveness of the Convention would be enhanced by developing compliance mechanisms).

C. THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS

Article I of the Stockholm Convention on persistent organic pollutants states that the Convention was developed "to protect human health and the environment from persistent organic pollutants (POPs)."[145] These chemical substances are persistent, toxic, bioaccumulate in fatty tissue in the food chain and are prone to moving long distances once released into the environment.[146] The past decades saw increasing awareness among the international community of the potential adverse health and environment consequences of POPs. Advances in science and the continuing work of experts, regulators, and activists have brought a better understanding of the effects of POPs. In combination with other features of long term persistence, long range transportation, and bioaccumulation, data proves that POPs can damage endocrine systems and can result in reproductive disorders, birth defects, and immune-system deficiencies.[147] The transport features of POPs result in atmospheric global circulation of vaporised POPs substances that are harmful.[148] For example, indigenous communities in colder climates are especially vulnerable to contamination, even though these substances originated many miles away. Furthermore, dietary exposure, including infants exposed through breast milk, workplace

145. Stockholm Convention, *supra* note 107, art. 1, 40 I.L.M. at 534.

146. *Id.*; *see also* Peter L. Lallas, *The Stockholm Convention on Persistent Organic Pollutants*, 95 AM. J. INT'L L. 692, 692 (2001) (explaining that because POPs bioaccumulate in fatty tissue they become more concentrated as they move up the food chain).

147. *See* WRI ET AL., *supra* note 9, at 55 (reporting that studies on persons living in the Great Lakes area indicate that exposure to POPs while in the womb and through breast milk can cause deficits in growth, neurological anamolies, and reduced short-term memories in small children).

148. *See* Bruce Rodan et al., Nat'l Ctr. for Envtl. Assessment, Envtl. Prot. Agency, Presentation at the Cartagena, Columbia Subregional Awareness Workshop on Persistent Organic Pollutants (POPs): International Action on Persistent Organic Pollutants (POPs): Developing Science-Based Screening Criteria (Jan. 27-30, 1998), *available at* http://www.chem.unep.ch/POPS/POPs_Inc/proceedings/cartagena/CRIRODAN.html (expounding that countries across the globe are instituting agreements to combat the effects of POPs that travel across borders to countries unequipped to combat the effects of these pollutants).

exposure, and others, can result in POPs contamination.[149] However, while there seems to be significant consensus about the harmful effects of POPs, significant uncertainties still exist.

Like the Rotterdam Convention, the Stockholm Convention creates a legal regime to phase out or eliminate twelve pollutants, including aldrin, chlordane, DDT, PCBs, and HCBs.[150] Ten of these are intentionally produced.[151] The Convention divides the intentionally produced substances into two distinct groups that are listed in separate annexes.[152] Parties are required to prohibit or take the necessary measures to eliminate the production and use of each substance listed in Annex A (the elimination annex), subject to the provisions listed in that annex.[153] Annex A lists nine of the ten intentionally produced substances and allows countries to register for country-specific time limited exemptions for some substances; parties are also required to restrict the production and use of substances in Annex B (the restriction annex).[154] Annex B also allows acceptable purposes for using DDT. This was because it was considered that the immediate threats of malaria, especially in developing, countries outweighed the long-term insidious environmental and health impacts from the use of DDT.[155]

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149. *See* WRI ET AL., *supra* note 9, at 55 (indicating that POP exposure can lead to population decline, biochemical changes, congenital abnormalities, and reductions in IQ and memory in school aged children).

150. Stockholm Convention, *supra* note 107, arts. 3, 5-6, Annexes A-C, 40 I.L.M. at 534, 535-39, 551-57 (outlining measures each party should take to reduce or eliminate intentional and unintentional production as well as stockpiles and wastes of specific chemicals listed within the Annexes of the Stockholm Convention).

151. *Id.* Annexes A-B, 40 I.L.M. at 551-55 (providing a list of chemicals to be reduced, eliminated, or restricted with indications of whether the chemical is intentionally produced or merely used).

152. *Id.* (stating that nine of the ten chemicals which are intentionally produced should be eliminated while the remaining chemical should be restricted in use).

153. *See id.* art. 3(1)-(2), Annex A, 40 I.L.M. at 534-35, 551-53.

154. *See id.* art. 3(1)(b), Annex B, 40 I.L.M. at 534, 554-55 (stating that parties should restrict the production and use of chemicals listed in Annex B unless the chemical exists in trace amounts as a result of unintentional production or already exists in use prior to the implementation of the Convention).

155. *See* Peter L. Lallas, *The Role of Process and Participation in the Development of Effective International Environmental Agreements: A Study of the*

The Convention also provides for the development of action plans at the regional or subregional level to identify, characterise, and address the release of the unwanted products.[156] These include evaluation of releases, strategies to meet the obligations, and a schedule for implementation.[157] Taking into account the Annex's guidance on prevention and release reduction measures, as well as guidelines to be developed by the Conference of Parties, the Convention encourages the promotion and development of substitute or modified materials, products and processes that prevent the formation and release of substances in Annex C.[158] The Convention calls for the development of appropriate strategies to identify and manage POPs-related stockpiles and wastes.[159] It also establishes the processes and criteria for adding new POPs for regulation.[160] Further, the Convention provides for funding and technical assistance to build capacity for its implementation by developing countries.[161]

The treaty has important implications for the protection and promotion of public health.[162] POPs are harmful to health and its

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Global Treaty on Persistent Organic Pollutants (POPs), 19 UCLA J. ENVTL. L. & POL'Y 83, 125 & n.140 (2001) (discussing the role of the World Health Organization in providing technical support to States to ensure that the POPs Treaty can be utilized as an instrument of public health protection).

156. Stockholm Convention, *supra* note 107, art. 5(a), Annex C, 40 I.L.M. at 536-37, 556-57 (indicating that parties to the Stockholm Convention have two years to implement an action plan to reduce releases from anthropogenic sources of all chemicals listed in Annex C).

157. *Id.* (requiring parties to include in their action plan methods to evaluate current laws and policies to address issues outlined in Article 5, steps to promote education concerning the release of chemicals listed in Annex C, and methods to review the progress of the strategies listed in the action plan every five years).

158. *Id.* art. 5(c), Annex C, 40 I.L.M. at 537, 556-57.

159. *Id.* art. 6, Annexes A-B, 40 I.L.M. at 538-39, 551-55 (requiring parties of the Stockholm Convention to identify, manage, and ensure appropriate collection and disposal of stockpiles and wastes of chemicals listed in Annexes A and B of the Convention).

160. *Id.* art. 8, Annex D, 40 I.L.M. at 540-41, 560-61 (specifying that, based on the information noted in Annex D of the Stockholm Convention, a country nominates a new substance for review by the POPs Review Committee, which then determines whether a proposed substance meets the criteria for persistence, bioaccumulation and the potential for long-range transport).

161. *Id.* arts. 12-13, 40 I.L.M. at 543-45.

162. *Id.* art 1, 40 I.L.M. at 534.

bioaccumulation in the food chain is a human health risk. It is for this reason that health is a criterion for regulating a substance.[163] Moreover, a lack of scientific certainty should not prevent the listing of a new substance under the treaty for regulation.[164] Secondly, by listing substances for regulation, the Convention helps to eliminate and ban the use of harmful persistent pollutants that are otherwise a threat to global public health. Finally, the Convention provides for an eventual phaseout of DDT in order to aid malaria control in developing countries. It also encourages Parties to provide technical and financial support to find alternatives to DDT, thereby supporting malaria control.[165] The double-edged role of the Convention in regulating DDT and promoting alternatives for malaria control shows how an environmental treaty can promote global public health.[166] It is yet to be seen how technical and financial assistance could be mobilized within the mechanisms of the treaty towards public health promotion relating to the POPs.

D. THE VIENNA CONVENTION ON THE PROTECTION OF THE OZONE LAYER

As noted earlier, air pollution has become a serious public health threat.[167] In particular, ozone depletion has become widespread in

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163. *Id.* Annex D, 40 I.L.M. at 560-61 (noting the required information for proposals to list chemicals under Annexes A, B, or C: chemical identity, evidence that the chemical has a half-life of longer than two months, evidence that the bio-concentration factor in aquatic species is greater than 5,000, potential long-range environmental transport information, and adverse effects of the chemical).

164. *See id.* art. 8(7), 40 I.L.M. at 540-41 (providing that a chemical likely to lead to adverse effects on public human health and the environment through long-range transport should be listed irrespective of scientific certainty regarding the effects).

165. *See* Lallas, *supra* note 146, at 692-93 (discussing the incentives, financial and otherwise, that developing countries can utilize to implement the Stockholm Convention).

166. *See* Stockholm Convention, *supra* note 107, Annex B pt. II (allowing for production and use of DDT for disease vector control); *see also* Lallas, *supra* note 146, at 692-93.

167. *See* WRI ET AL., *supra* note 9, at 63 (indicating that severe air pollution can lead to serious health risks such as heart disease, cancer, or even death); *see also* WHO ROE, AIR QUALITY GUIDELINES FOR EUROPE 57-194 (2d ed. 2000),

cities in Europe, North America and Japan as auto and industrial emissions have increased.[168] Ozone depletion has been attributed to the releases of chlorofluorocarbons ("CFCs") and other ozone depleting chemicals.[169] Cities in many developing countries also have high ozone levels.[170] Ozone pollution has led to the irritation of the respiratory tract and can lead to impaired lung functions, coughing, shortness of breath, and chest pain.[171] With the rise of ozone levels, respiratory illnesses such as asthma increase.[172] Furthermore, ozone depletion has been linked to biologically damaging components of sunlight which has led to increases in incidence of skin cancers and cataracts.[173] In an effort to restore the integrity of the atmosphere, international action led to the development of the Vienna Convention for the Protection of the Ozone Layer,[174] the Montreal Protocol to the Vienna Convention for the Protection of the Ozone Layer[175] and the

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available at http://www.who.dk/document/e71922.pdf (describing the effects of air pollution and how to assess the related health effects).

168. *See* WRI ET AL., *supra* note 9, at 65.

169. *See* WHO, *supra* note 110, at 239 (reporting that CFCs found in refrigerants, propellants, plastic foam blowers, and cleaning agents for electronic circuitry, along with other substances like fire-fighting halons, lead to the depletion of the ozone).

170. *See* WRI ET AL., *supra* note 9, at 65; *see also* WHO, *supra* note 110.

171. *See* WRI ET AL., *supra* note 9, at 65 (citing the American Lung Association's estimation that 10,000 to 15,000 additional hospital admissions occurred during 1993-94 due to ozone levels that were higher than the ozone level in the United States); *see also* WHO ROE, CLIMATE CHANGE AND STRATOSPHERIC DEPLETION, EARLY EFFECTS ON OUR HEALTH IN EUROPE 53-58 (Sari Kovats et al. eds., 2002), *available at* http://www.euro.who.int/document/e71230.pdf.

172. *See* WRI ET AL., *supra* note 9, at 65; *see also* WHO ROE, *supra* note 171.

173. *See* WHO, *supra* note 110, at 239 (asserting that some forms of cataracts are associated with long-term exposure to the sun); *see also* WHO, PROTECTION AGAINST EXPOSURE TO ULTRAVIOLET RADIATION (1995), *available at* http://www.who.int/docstore/peh-uv/pub/whoehg95-17.htm (indicating that U.V. exposure is also thought to cause suppression of the immune system and that in the United States alone it costs 3.4 billion dollars for the 1.2 million dollar cataract operations performed annually); WHO ROE, *supra* note 171.

174. Vienna Convention, *supra* note 108, pmbl., 1513 U.N.T.S. at 324 (asserting that the parties to the Convention are committed to protecting the environment and public health from the adverse effects of the depleting ozone).

175. Montreal Protocol, *supra* note 108, pmbl. (affirming that the parties to the Montreal Protocol are committed to protecting the ozone layer in order to combat

related London Amendment,[176] the Copenhagen Amendment,[177] Montreal Amendment,[178] and the Beijing Amendment.[179]

The Vienna Convention establishes a framework for the adoption of measures to protect human health and the environment against adverse effects resulting or likely to result from human activities that modify or are likely to modify the ozone layer.[180] It requires parties to cooperate in the assessment of the effects on human health and environment from the modification of the ozone layer.[181] The Convention also requires parties to initiate and cooperate in the conduct of research and scientific assessments on human health.[182] This includes assessment of the biological effects deriving from any modifications of the ozone layer, particularly those resulting from changes in ultraviolet solar radiation causing biological effects.[183] The Convention encourages cooperation in the legal, scientific, and technical fields.[184] It provides for exchange of information and provides for Annexes to elaborate on these obligations and roles.[185] The Convention provides for a role for the World Health Organization in providing technical support to achieve the objectives

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the negative effects on human health association with the depletion of the ozone layer).

176. London Adjustments and Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer, June 29, 1990, 30 I.L.M. 541 (1991).

177. Copenhagen Adjustments and Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer, Nov. 25, 1992, 32 I.L.M. 874 (1993).

178. UNEP, Report of the Ninth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, Annex IV, U.N. Doc. UNEP/OzL.Pro.9/12 (Sept. 25, 1997) [hereinafter Montreal Amendment].

179. UNEP, Report of the Eleventh Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, Annex V, U.N. Doc. UNEP/OzL.Pro.11/10 (Dec. 17, 1999).

180. Vienna Convention, *supra* note 108, art. 2(1), 1513 U.N.T.S. at 326.

181. *Id.* art. 2(2)(a), 1513 U.N.T.S. at 326 (mandating that parties to the Vienna Convention perform systemic observations, research, and information exchange to assess the effects of ozone depletion on human activities).

182. *Id.*

183. *Id.* art. 3(1), 1513 U.N.T.S. at 326.

184. *Id.* art. 2, 1513 U.N.T.S. at 326.

185. *Id.* art. 4, Annex II, 1513 U.N.T.S. at 327, 338 (requiring the exchange of scientific, technical, socio-economic, commercial, and legal information that can be shared efficiently among parties).

of the Convention.[186] The Convention also encourages research and exchange of information regarding human health effects of the ozone.[187]

The Montreal Protocol on Substances that Deplete the Ozone Layer makes specific legal obligations, including limitations and reductions on levels of consumption and production of certain controlled Ozone depleting substances.[188] The Preamble to the Convention recognized that the depletion of the Ozone layer is a threat to human health and the environment.[189] Together with the 1990 Amendment, the Convention regulates the consumption and production of CFCs, halons, carbon tetrachloride, methyl chloroform, and HCFCs.[190] These treaty regimes also provide for technical and financial support, especially for developing countries, to facilitate their implementation of the Convention and Protocols.

A critical analysis of the Montreal Protocol reveals that it has included some provisions regarding public health.[191] The language of the Protocol and the obligations established reveal that this is a global public health treaty.[192] However, the Protocol is unclear regarding the potential use of financial, technical, and other mechanisms for the promotion of public health programs.[193] Arguably, the real hazards of ozone depletion are those that pose a

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186. *Id.* art. 6(4)(j), 1513 U.N.T.S. at 328 (noting that the Conference of Parties must request the support from the WHO and World Meteorological Organization).

187. *Id.* Annex I, 1513 U.N.T.S. at 335 (indicating that the parties are required to monitor and research the depletion of the ozone layer and the vertical distribution of ozone).

188. Montreal Protocol, *supra* note 108, art. 3 (providing a method for calculating accecptable levels of production and consumption of chemicals that lead to the depletion of the ozone layer).

189. *Id.* pmbl.

190. *Id.* art. 2(a)-(i) (requiring all parties to provide calculated levels of all chemicals listed in the Montreal Protocol every twelve months beginning seven months after the Protocol takes effect).

191. *See, e.g., id.* art. 9.

192. *See, e.g., id.* pmbl. (recognizing the parties' commitment to protect human health and to combat the effects of ozone depletion).

193. *Id.* arts. 10-11 (outlining means of transferring funds and technology from developed countries to developing countries to assist in the implementation of the Protocol's provisons).

risk to human health, with recognition that environmental risks are key and threaten the future survival of the planet. With the serious global public health implications associated with the depletion of the ozone layer, the health sector can play an important role in the implementation and realization of the objectives of the treaty. Nevertheless, the Protocol has added to the corpus of international environmental law that will help promote global public health.

E. THE CONTRIBUTION OF INTERNATIONAL ENVIRONMENTAL LAW TO HEALTH PROTECTION

From the 1972 United Nations Conference on the Human Environment in Stockholm to the World Summit on Sustainable Development in 2002, the role of international environmental law in promoting public health has progressively gained prominence internationally and domestically within States. An increased partnership between health and environment sectors has continued to advance environmental health goals while international environmental law is considered effective in achieving public health goals.[194] However, legal scholars have advanced means to assess the effectiveness of international environmental law. Effectiveness includes compliance, behavioral change to meet requirements of the treaty in question, and the ability of the treaty to solve the problem it set out to solve.[195] The treaties discussed above require States parties to undertake a number of actions such as the banning of certain chemicals under the PIC and POP Conventions.[196] Compliance with these treaties through domestic measures can reduce the threat to human health and ensure the effectiveness of these treaties.[197]

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194. *See* von Schirnding et al., *supra* note 7, at 972-73 (discussing the contribution of international environmental conventions to the promotion of global public health through technical and financial support and through effective linkages for health).

195. *See* Daniel Bodansky, *What Makes International Agreements Effective? Some Pointers for the WHO Framework Convention on Tobacco Control*, at 24-30, WHO Doc. WHO/NCD/TFI/99.4 (1999) (defining the three meanings of effectiveness, and stating that behavioral effectiveness is central to international law since it measures how much the treaty has improved the *status quo*).

196. *See, e.g.*, Stockholm Convention, *supra* note 107.

197. *See* Bodansky, *supra* note 195, at 23 (explaining that compliance and strong rules are necessary for optimum effectiveness).

Scholars have generally commented on the good compliance rates with the plethora of international environmental instruments despite weaknesses relating to their implementation such as the enforcement measures.[198] However, compliance must also achieve the ultimate goals of the treaty in question to make them successful. In many treaties, the enforcement mechanisms have been inadequate, absent or weak.[199] This has reduced the benefits that the treaties can deliver for the protection of health or the environment.[200] Strengthening the enforcement mechanisms such as reporting obligations and judicial and administrative actions, the use of the media and civil society are key to ensuring the effectiveness of international environmental law for public health.

It is yet to be seen if these treaties will be effective in achieving environmental and public health goals in the long term, particularly at the national level. In general, however, it would seem that there is a trend towards strengthened implementation and compliance in environmental agreements. For example the Montreal Protocol has had phenomenal success achieving a ninety percent phase-out of ozone depleting substances by 2004.[201] Some factors for this success

198. *See* Joseph DiMento, *International Environmental Law: A Global Assessment*, 33 ENVTL. L. REP. 10387, 10387-89 (2003) (reviewing five multilateral environmental conventions and concluding that despite some mixed records and the need for further action, environmental conventions have been successful); *see also* Scott Barrett, *International Cooperation and the International Commons*, 10 DUKE ENVTL. L. & POL'Y F. 131, 137-38 (1999) (stating that the negotiators of the agreement were more concerned with the timetable of the agreement than its enforcement).

199. *See* Richard W. Emory, Jr., *Probing the Protections in the Rotterdam Convention on Prior Informed Consent*, 2000 COLO. J. INT'L ENVTL. L. & POL'Y, 2000 Y.B. 47, 67-68 (2001) (criticizing the Rotterdam Convention on Prior Informed Consent because it has done very little to define national measures and tools for effective shipment tracking and compliance monitoring for hazardous chemicals, and noting that there are no clear means for effective MEA implementation).

200. *See id.* at 68 (finding that the incapability of governments to enforce these treaties impairs the agreements and makes them less effective).

201. *See* GILBERT M. BANKOBEZA, OZONE PROTECTION: THE INTERNATIONAL LEGAL REGIME 307, 307-08 (2005) (stating that the reasons for the success include the cooperative approach by both developing and developed countries, the provision of financial assistance to developing countries, and the role of science and technology research in identifying alternatives); *see also* Elizabeth R. DeSombre, *The Experience of the Montreal Protocol: Particularly Remarkable,*

include the fear of international shaming effect, the human implications from the depletion of the ozone layer, and the threats to public health.[202]

One of the strengths of environmental treaty regimes is the inclusion of requirements that provide financial and technical assistance to developing countries to implement the treaties in question. In this regard, the establishment of the Global Environmental Facility ("GEF"), which was created in 1991, has served to support the implementation of a number of treaties, including in the areas of climate change, ozone layer depletion, international waters, and most recently, the POPs treaty. The GEF has provided funding for national implementation of treaty obligations and has a potential to provide funding for national health programs if justified within the framework of treaties concerned.[203] Article 10 of the Montreal Protocol led to the creation of the Multilateral Fund and by 2004, the Fund had a total of $1.77 billion to be disbursed for phase out of ozone depleting substances in developing countries.[204] This will, in the long run, prevent the health threats posed by the depletion of the ozone. Other compliance tools such as the reporting obligations of the Parties, the enactment of national legislation, the preparation of national plans of action, and an international review mechanism in a number of the health-related

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and Remarkably Particular, 19 UCLA J. ENVTL. L. & POL'Y 49, 50-78 (2001) (claiming that while it is still too soon to see significant improvement in the ozone layer, measurements indicate it is deteriorating at a decreasing rate, with concentrations of some ozone depleting substances starting to decline). Without the Montreal Protocol, it is doubtful that such dramatic declines would have resulted. *Id.*

202. *See* BANKOBEZA, *supra* note 201, at 308 (concluding that the Protocol only worked through the combined efforts of developing and developed countries).

203. *See* UNEP, *Outline of a UNEP Project Portfolio on Persistent Toxic Substances in the Framework of the Global Environment Facility International Waters Portfolio*, ¶¶ 3.1-3.3, U.N. Doc. UNEP/POPS/INC.1/INF/14 (July 1, 1998) (delineating financial considerations for the GEF Council that include guidelines for funding of health and environmental projects).

204. Montreal Protocol, *supra* note 108, art. 10 (providing the financial rules and guidelines under which the Montreal Protocol will operate); *see* BANKOBEZA, *supra* note 201, at 233-35.

environmental treaties have served to ensure the success of such legal regimes.[205]

Finally, there is increasing participation by the health sector in development of environmental conventions.[206] The effectiveness of international environmental law in protecting health also requires a critical examination of national implementation trends, particularly the domestic, legal, and institutional governance mechanisms for the environment and the protection of human health.

IV. HEALTH AND DOMESTIC ENVIRONMENTAL GOVERNANCE MECHANISMS IN DEVELOPING COUNTRIES

A. NATIONAL ENVIRONMENTAL GOVERNANCE, AN INTRODUCTION

Recourse to multilateral environmental agreements to promote human health is fraught with difficulties. Developing countries require enabling legal and institutional frameworks to successfully take advantage of environmental laws to promote health.[207] The lack of capacity to implement health-related environmental law is also a serious concern. Furthermore, a lack of horizontal integration of

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205. *See generally* Bansuri Taneja, LEGISLATIVE HARMONISATION: MEETING THE REQUIREMENTS OF THE CBD AND OTHER MULTILATERAL ENVIRONMENTAL AGREEMENTS, http://www.unep.org/bpsp/Legislation/Case%20studies/INDIA%20(Legal).pdf (describing the methods in which a country would adhere to the requirements of a multilateral environmental agreement, using India and its region as an example).

206. *See* Lallas, *supra* note 146, at 702 (reporting that the WHO actively provided technical assistance during the negotiations of the Stockholm Convention on Persistent Organic Pollutants); *see also* Inter-Organization Programme for the Sound Management of Chemicals, Inter-Organization Coordinating Committee, http://www.who.int/iomc/iocc/en (establishing that the WHO actively promoted the implementation of international environmental Conventions).

207. *See* WHO, Regional Committee for Africa, *Environmental Health: A Strategy for the African Region*, ¶¶ 24-27, WHO Doc. AFR/RC52/10 (Feb. 2, 2002), *available at* http://www.afro.who.int/des/phe/publications/reg_strategy_env_health.pdf [hereinafter *Strategy for African Region*] (mentioning specifically the ministries of health in developing countries taking the lead in implementing policies for public health concerns); *see also* William L. Andreen, *Environmental Law and International Assistance: The Challenge of Strengthening Environmental Law in the Developing World*, 25 COLUM. J. ENVTL. L. 17 (2000).

health and environmental legal and institutional frameworks undermine the positive health potential of environmental treaties.[208] While multisectoral responses to environment and health concerns are essential, existing domestic environmental and health regimes in developing countries have continued to be addressed sectorally, without comprehensive legal strategies to promote environmental health.[209]

In order to better understand the national health and environment linkages, it is important to map out domestic environmental protection trends in developing countries. These trends are both legal and institutional. Regarding the legal trends, firstly, the environment is increasingly protected by the constitutions of many developing countries.[210] A number of countries also provide constitutional guarantees to protect health.[211] These constitutional provisions show the high priority States accord to the protection of the environment, sustainable development, and the protection of human health.[212] In

208. For an example of a region attempting to create horizontal integration, see *Strategy for African Region*, *supra* note 207, ¶¶ 24-27; *see also* Press Release, WHO AFRO, Environmental Health in Africa, Role of Health Ministries (Sept. 4, 1998), http://www.afro.who.int/des/phe/publications/reg_strategy_env_health.pdf (describing the legal and institutional lacuna in addressing environment and health concerns); Lalanath De Silva, *Environmental Law Development in South Asia*, 4 ASIA PAC. J. ENVTL. L. 243, 249 (1999) (stating that the origin of environmentalism in the developed world was always related to recreation and aesthetics). But environmental activism in South Asia is in part about survival. *Id.* In this context, issues such as involuntary displacement and resettlement, and basic human needs of water and sanitation, become central to environmental law. *Id.*

209. *See* Press Release, *supra* note 208 (finding that in order to promote good environmental health, developing countries must strenghthen intersectoral collaboration between environmental health actors and other stakeholders).

210. *See* Carl Bruch et al., *Constitutional Environmental Law: Giving Force to Fundamental Principles in Africa*, 26 COLUM. J. ENVTL. L. 131, 132-35, 150-88 (2001) (describing the emergence of constitutional environmental protection in many African countries and stating that in Africa alone, over thirty countries provide for constitutional protection of the environment).

211. *See* Eleanor D. Kinney & Brian Alexander Clark, *Provisions for Health and Health Care in the Constitutions of the Countries of the World*, 37 CORNELL INT'L L.J. 285, 287-91 (2004) (describing health-related constitutional provisions in a number of developing countries). Approximately 67.5% of the constitutions of all nations have language regarding health care. *Id.*

212. *See id.* at 287-88 (determining that a State's constitutional provisions on healthcare demonstrate a commitment to the assurance of access to high quality

this regard, the constitutional protection of the environment also provides an important mechanism for health protection at the national level, through the development and application of constitutional law, legal principles, and jurisprudence. Secondly, as a consequence of many developing countries having become Parties to international environmental agreements, there is an increasing trend towards the enactment of comprehensive legislation, known as framework legislation, which addresses broad aspects of environmental concerns such as pollution control, waste management, regulation of chemicals, and water quality.[213] These laws have become standard setting and normative instruments for environmental protection in general, but *a fortiori*, can serve to promote public health. Thirdly, the use of an environmental impact assessment to prevent damage to the environment has become a key component of national environmental policy and management. While some countries have relied on existing laws to conduct such assessments, others have enacted separate legislation.[214]

At the institutional level, firstly, the development of environmental protection in developing countries has involved the establishment of separate executive units for the environment.[215] Hence, core

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healthcare services for its people); *see also* Bruch et al., *supra* note 210, at 133 (highlighting that modern awareness of environmental concerns has led to the environment becoming a political priority, specifically with some constitutions guaranteeing "a right to a healthy environment").

213. *See* UNEP Partnership for the Development of Environmental Laws and Institutions in Africa [PADELIA], *Compendium of Environmental Laws of African Countries: Volume 1 Framework Laws and EIA Regulations*, http://www.unep.org/padelia/publications/Compl.htm (detailing various Framework Environmental Laws enacted by African nations). For a specific example of Framework Legislation, see Libyan legislation found at http://www.unep.org/padelia/publications/compl Libya.pdf.

214. *See, e.g.*, Environmental Impact Assessment Decree No. 86 (1992) § I (Nigeria) (listing the general principles of environmental impact assessment legislation created by Nigeria in 1992). The general principles include when and where impact assessment will be needed, and describe what situations significantly impact the environment enough for the requisite study under the legislation. *Id.*

215. *See, e.g.*, *id.* § II ¶¶ 20-31 (calling for the creation of an independent environmental agency to conduct any impact assessment and report its findings to the Nigerian government agency); *see also* Benjamin J. Richardson, *Environmental Law in Postcolonial Societies: Straddling the Local—Global Institutional Spectrum*, 11 COLO. J. INT'L ENVTL. L. & POL'Y 1, 21-29 (2000)

environment management has been devolved to one unit that coordinates environmental protection activities of government, while other sectors retain residual environmental protection functions.[216] Despite this, other units of government also retain an important role in sectoral environment management.[217] Secondly, capacity building, and technical and financial assistance have become essential for national environmental management. Finally, national environmental legal regimes have endowed the civil society with an important role in environmental protection. In this connection, a number of developing countries have included in their laws express provisions regarding participation of civil society by enabling public comment and review of environmental protection policies and practices, consultations, and provisions regarding public interest litigation.[218]

The following sections examine the legal and institutional mechanisms for the protection of the environment and how health protection can be enhanced within these mechanisms. These mechanisms include the role of national action plans, national legislation, the roles of centralized focal institutions for the environment, the role of the Health Ministry, the civil society, the importance of environmental impact assessments, and the role of the courts and constitutional law.

(discussing the legislative framework in many developing countries that call for the creation of national environmental agencies).

216. In most developing countries, despite attempts at harmonization and integration, the development and implementation of sectoral environmental laws such as environmental health laws, fishery laws, laws on land regulation, energy and transport laws, water laws, and general agricultural laws are usually managed by the respective executive units.

217. *See, e.g.*, Environment Protection and Pollution Control Act (1990), § 4(1) (Zambia) (establishing an environment council composed of ministries responsible for, inter alia, water, lands and mineral resources, agriculture, mines, commerce and industry, health, power, transport and communications, labor, social development and culture, tourism, higher education, science and technology). Under Section 6(1), the environment council is responsible for protection of the environment and control of pollution, so as to provide for the health and welfare of persons, animals, plants, and the environment. *Id.*

218. *See* Environmental Impact Assessment Decree No. 86, § II (ordering that a review panel shall hold a public hearing for civilian review and prepare the report for public consumption); *see also* Bruch, *supra* note 210, at 179-85 (providing some examples of national and international precedents recognizing "a right to access of environmental information").

B. NATIONAL ENVIRONMENTAL ACTION PLANS

A number of multilateral environmental conventions with implications for public health require States parties to develop national plans of action as a first step toward implementation of the international obligations.[219] Similarly, national environmental laws of most developing countries require the periodic development of national plans of action for the environment.[220] Powers regarding the development of these plans usually lies with the focal point for the environment with inputs from other relevant units of government. In this regard, a number of countries have adopted national plans of action for the environment, or national plans of action for health and the environment.[221] Many developing nations have adopted centralized command and control type of national implementation or action plans, managed principally by one main institution.[222] The tendency has also been to integrate environmental plans into the social and economic development of the countries. The challenge has been over centralized environmental decisionmaking with bureaucratic environmental governance structures, where local

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219. *See, e.g.*, Stockholm Convention, *supra* note 107, art. 7; Framework Convention, *supra* note 105.

220. *See, e.g.*, Environment Management Act, No. 5 of 2002, ¶ 30 (Swaziland), *available at* http://www.elaw.org/resources/text.asp?ID=2480 (providing that within two years of the Act coming into force and every five years thereafter, the Swaziland Environment Authority must prepare and publish a National Environmental Action Plan).

221. *See* WHO, Regional Office for South-East Asia, National Health and Environment Action Plans, http://w3.whosea.org/EN/Section23/section1318.htm (describing generally environmental and health action plans of Sri Lanka, Thailand, Maldives, and Bangladesh that contain comprehensive coverage for health and the environment).

222. *See* WHO, NATIONAL ENVIRONMENTAL ACTION PLAN 1998-2001: EXECUTIVE SUMMARY (2001), http://w3.whosea.org/LinkFiles/National_Environment_&_Health_Action_Plan_execsumm.pdf (recommending institutional procedures for an Environmental Action Plan to create a central government with a clear mandate to delegate to other mechanisms); *see also* Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV. 115 (2004) (providing a detailed discussion of command and control type of environmental management); Parvez Hassan & Azim Azfar, *Securing Environmental Rights Through Public Interest Litigation in South East Asia*, 22 VA. ENVTL. L.J. 215 (2004) (providing an overview of the developments in environmental law in India, Pakistan, and Bangladesh through examinations of important case law).

authorities and rural communities may not adequately participate in environmental management. These plans may also omit health protection issues. The emphasis of curative health over preventive health has presented obstacles in promoting health within the framework of national environmental governance. Yet, environmental challenges require a multifaceted approach including a number of evidence based health issues.

While environment Action Plans are common starting points in domestic environmental governance, a number of countries such as Bangladesh and Thailand have developed integrated environment and health Action Plans.[223] Such plans can ensure that opportunities and synergies between health and the environment can be improved. Environment and Health Action plans can provide the basic frameworks for the active participation of the health, environment, and related governmental sectors from the early stages in the protection of the environment and public health.

C. NATIONAL ENVIRONMENTAL (AND HEALTH) LAWS

International environmental treaties usually require States parties to adopt national laws to implement treaty obligations.[224] At the global level, environmental laws have evolved within two evolutionary periods, the pre and post-1972 United Nations Conference on the Human Environment held in Stockholm eras.[225] In the first period, environmental legislation and management was predominantly fragmented, sectoral and piecemeal, and biased

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223. *See* WHO, Regional Office for South-East Asia, National Health and Environment Action Plan–Thailand Executive Summary, http://w3.whosea.org/EN/Section23/Section1318/Section1797_7723.htm (on Thailand); *see also* Hassan, *supra* note 222, at 221 (on Bangladesh).

224. *See, e.g.*, Rotterdam Convention, *supra* note 106, art. 15, 38 I.L.M. at 10-11.

225. *See* P. WILSON ET AL., EMERGING TRENDS IN NATIONAL ENVIRONMENTAL LEGISLATION IN DEVELOPING COUNTRIES, *reprinted in* I CAPACITY BUILDING FOR ENVIRONMENTAL LAW IN THE ASIAN PACIFIC REGION: APPROACHES AND RESOURCES 173, 174-75 (Donna G. Craig et al. eds., 2002) (contending that the Stockholm Conference was the key moment in the historical evolution of environmental legislation). The Stockholm Conference was important because it increased environmental awareness and encouraged governments to change their legal and governmental institutions to adopt environmental legislation. *Id.*

towards natural resource management. However, the post-1972 Stockholm era has witnessed the increasing development of integrated regulatory frameworks with environment specific national agencies, while residual sectoral environmental management remains.[226] With new developments such as legal regimes on ozone protection, climate change, and biological diversity, it has become essential to enact comprehensive national environmental laws.

These prototype framework environmental laws are marked by specialized executive authorities that develop and administer environmental laws and policies.[227] In the developing countries, the lists of countries that have enacted such laws continue to grow.[228] In Africa, the UNEP/UNDP Joint Project on Environmental Law and Institutions in Africa has helped to support environmental law reform and development in a number of countries in Africa.[229] The forms and substantive provisions of a number of these laws, however, have been driven by the activities of UNEP and other green organizations, such as the International Union for the Conservation of Nature. While some national implementing laws provide for health, other laws have been noted for being too ecocentric and not responsive to the social and economic development needs of local populations.[230] For example, in Uganda, the National Environmental Statute

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226. *See generally id.* at 174-78 (contending that the framework environmental legislation primarily deals with cross-sectoral environmental issues such as environmental management, sustainable development, environmental planning, dispute settlement, and public education). However, in certain instances, the legislation still deals with purely sectoral issues. *Id.*

227. *See id.* at 183.

228. *See* PADELIA, *supra* note 213 (listing a number of framework environmental laws for developing countries in the continent of Africa).

229. *See* PADELIA, Project History, http://www.unep.org/padelia/history/background.html (noting the UNEP/UNDP Environmental Law in Africa Project has supported capacity building activities in the area of law and helped to map out the range of existing laws for the environment in Africa including the monitoring of developing case law).

230. *See* Benjamin J. Richardson, *Environmental Law in Postcolonial Societies: Straddling the Local—Global Institutional Spectrum*, 11 COLO. J. INT'L ENVTL. L. & POL'Y 1, 19 (2000) (stating that "preservationist" models of nature conservation have been denounced as eco-colonialism by some developing countries, and citing Malaysia and Brazil as resistant to purely ecocentric approaches); *see also* Alexander Gillepsie, *The Malaysian Agenda and Influence on the Tropical Deforestation Debate*, 1 ASIA PAC. J. ENVTL. L. 25 (1996) (verified by author).

provides for a right to a healthy environment.[231] However, it is unclear whether in the absence of appropriate implementation frameworks, provisions of this nature can promote public health. As has been noted, the establishment of proper institutional and legal frameworks and the effective implementation of environmental legislation continue to be among the most imposing challenges for developing countries.[232]

An important concern is that the various framework environmental laws have not been the panacea to all environmental problems, including environmental health threats. Despite the enactment of comprehensive framework national environmental laws in developing countries, a number of the sectoral laws in the area of agriculture, food, mining, health, forestry, and transportation sectors continue to form part of the body of national laws on environmental protection.[233] In this connection, in the absence of sectoral legal reforms, sectoral laws may not effectively contribute to the national implementation of international environmental law and enhance national environmental management. Despite attempts for integration, it is noteworthy that in recent decades, the fields of public health, environmental protection, lands, and agriculture have become increasingly specialized and the connection between the environment and public health have become fractured.[234] A number of factors explain countries' failure to comply with international environmental agreements, including "fragmented internal

231. National Environment Statute, § 4, LXXXVIII Uganda Gazette No. 21 Supp. (1995) (providing that every person has a right to a healthy environment and every person has a duty to maintain the environment, including the duty to inform the Authority on activities that affect the environment). In furtherance of the right to a healthy environment and enforcement and the duty to maintain and enhance the environment, the local environment committee can bring action against any other person whose activities are likely to have a significant impact on the environment. *Id.*

232. *See* WILSON ET AL., *supra* note 225, at 186.

233. *See, e.g.*, Maritime Zones Act (1989), § 11 (Kenya) (holding that the Minister may give effect to any convention affecting the maritime zones and using the example of maritime law as part of overall environmental protection law).

234. In most developing countries, separate Ministries administer the various sectoral laws and while these form part of the national environmental legal regime, the governance mechanisms to integrate them to protect public health and the environment is still inadequate.

decisionmaking procedures on environmental matters, . . . conflicting mandates," and uncooperative government agencies.[235] While some of these laws were criticized for being biased to natural resource management, some of the laws have aimed at the protection of human health.[236] These sectoral laws have contributed in the face of legal lacuna to support domestic environmental protection. Public health statutes and other laws of various types are one set of such laws. Unfortunately, public health laws relevant to environmental health in developing countries such as the Public Health Acts have increasingly become obsolete.[237] These laws were adopted in the colonial era and have failed to fully meet requirements of modern public health challenges, including the failure to keep pace with emerging domestic and transnational environmental and health concerns.[238]

The Public Health Acts in developing countries have not only failed to address environmental health threats but have been ineffective in dealing with emerging communicable and

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235. Ibrahim F.I. Shihata, *Implementation, Enforcement, and Compliance with International Environmental Agreements—Practical Suggestions in Light of the World Bank's Experience*, 9 GEO. INT'L ENVTL. L. REV. 37, 50 (1996) (listing "limited enforcement capability" and lack of financing and technological solutions as other reasons why developing countries fail to comply with international environmental agreements).

236. *See* Annie Patricia Kameri-Mbote & Philippe Cullet, *Law, Colonialism and Environmental Management in Africa*, REV. EUR. COMMUNITY & INT'L ENVTL. L., Mar. 1997, at 23, 23-24 (describing colonial law in particular as being more concerned with extraction of natural resources than with protecting the population for the overall welfare of the nation); *see also* Anne Angwenyi, *Environmental Legislation and Domestication of International Environmental Law in Kenya* (presented at the Sesei Programme, Sub-Regional Legal Workshop Nairobi, Dec. 13-17, 2004), *available at* http://www.baselpretoria.org.za/Documents/Legislation/Kenya-enviro-laws,%20research.pdf (listing land, water, fisheries, and public health laws as forming the corpus of the body of domestic environmental law in Kenya); Dwasi, *supra* note 114 (discussing public health laws as forming part of the domestic legislation for managing pesticides).

237. *See* Kameri-Mbote & Cullet, *supra* note 236, at 27-28 (describing the failure of African ex-colonies to implement public health laws in the face of natural resource extraction concerns).

238. *See generally* Public Health Act, 1848 (Eng.), *reprinted in* 83 BULL. WORLD HEALTH ORG. 868 (2005) (citing British law as an example for current Public Health Acts which served as a guide for their evolution).

noncommunicable diseases.[239] For example, Kenya's Public Health Act has limited provisions addressing nuisance, sanitation, malaria, public water supplies, and irrigation of agricultural lands, but their drafting and coverage is not comprehensive.[240] Moreover, these laws do not address broad issues of environmental protection such as pollutants and pesticides. The Kenyan Act also addresses aspects of drinking water by regulating pollution in wells, tanks, and other sources of water,[241] but these have been poorly enforced.[242] Furthermore, there is a shortage of qualified public health officials to support implementation of the Act.[243] There are important overlaps between the mandates of public health officials under the Public Health Act and that of other sectoral environmental laws. In such a situation, a number of environmental health threats that are not adequately dealt with under this framework and other environmental laws fail to be addressed by Public Health Laws. Part of the problem has been the dynamic nature of modern health threats and the weak enforcement mechanisms that are a feature of the colonial era public health laws.[244] However, public health laws can play significant roles in implementing international environmental law norms. Furthermore, many countries, including those with comprehensive environmental legislation, still continue to expand the range of

239. See, for example, Uganda's Public Health Act Cap 281, which cannot implement tobacco control programs because Tobacco causes cancer that is a noncommunicable disease.

240. Public Health Act, ch. 242, 1977 (Kenya) (amended 1986).

241. *Id.* § 126.

242. *See The Constitution of Kenya Review Commission*, http://www.kenya constitution.org/docs/11d121.htm (last visited Apr. 7, 2006) (commenting that the Kenyan Constitution needs to be reviewed and updated on certain issues, particularly health sector enforcement).

243. *See Policy and Planning Related to Water, Sanitation, and Management of Menstruation in Public Schools*, http://www.femshuleni.org/studies/kenya/mati.htm (last visited Apr. 7, 2006) (providing a guide for future policy decisions regarding public health in Kenya public schools, including ways in which the Public Health Act can be better implemented by public health officials).

244. *See* NEW ZEALAND MINISTRY OF HEALTH, PUBLIC HEALTH LEGISLATION: PROMOTING PUBLIC HEALTH, PREVENTING ILL HEALTH AND MANAGING COMMUNICABLE DISEASES §§ 3.4-3.6 (2002) (identifying inequalities in economic and social determinants of health, and the enforcement problems related to future health problems and the antiquated system established by previous health laws).

environmental health laws that have major provisions for the protection of the environment.[245]

Therefore, to enable the national health actors to more fully implement modern international environmental law and participate in environmental management in order to promote public health, there is need for legislative reform of the Public Health Acts and other sectoral health legislation, including environmental health laws.[246] The WHO has urged the Ministries of Health to reformulate "the missions and functions of national directorates of health, technical divisions and services of health and related sectors" and other stakeholders and to reinforce "intersectoral collaboration between all environmental health actors and stakeholders" and institute the proper "legal framework for implementing environmental health activities."[247] This call can help integrate implementation of international conventions into the public health agenda of developing countries.

D. ENVIRONMENTAL (AND HEALTH) IMPACT ASSESSMENTS

From the 1972 Stockholm Conference on the Human Environment and the 1992 U.N. Conference on Environment and Development to date, environmental impact assessment ("EIA") has become a pivotal legal technique in integrating environmental considerations into socioeconomic development.[248] An environmental impact assessment is a process and report used to provide information on the environmental consequences of proposed projects to

245. *See generally* Environmental Health Act, ch. 99, § 7 (1980) (Solomon Islands) (strengthening the power of the health minister to protect public health by granting him the authority to order the necessary enforcement agency to do its duty and take necessary steps to protect public health).

246. *See* YASMIN VON SCHIRNDING, HEALTH IN SUSTAINABLE DEVELOPMENT PLANNING: THE ROLE OF INDICATORS 118-19 (2002) (stating that the enactment of domestic legal frameworks is a key action indicator of the integration of health into sustainable development, and measures could include public policy or comprehensive health plans).

247. Press Release, *supra* note 208.

248. *See, e.g.*, *Rio Declaration*, *supra* note 59, princ. 17 (stating that, "environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority").

decisionmakers.[249] These assessments require that all decisions related to the project be influenced by the information in the report and ensures that those affected by the projects are able to participate in the process.[250] A number of developing countries have adopted specific domestic legislation on EIA.[251] Other countries have included provisions within framework environmental laws to conduct environmental impact assessments.[252] The EIA laws in most developing countries establish rules for the conduct of an EIA. These include the elaboration in detail of the role of the principal agency responsible for managing and reviewing environmental impact assessments for various projects and guidelines on roles and participation of stakeholders in the EIA process.[253]

Development projects often impact both human health and the environment and result in unintended consequences to humans.[254] Environmental impact assessments are not usually composed of

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249. *See* SANDS, *supra* note 57, at 579 (explaining the importance of environmental impact assessments as a legal method for integrating environmental issues into domestic and international development).

250. *See id.* (noting that the United States was the first to establish environmental impact assessments in its domestic laws). Environmental impact assessments have since been adopted in other domestic legal systems as well as required under certain international directives. *Id.*

251. *See, e.g.*, Environmental Impact Assessment Regulations, § 5, S.I. 107/1995 (Belize) (requiring that environmental impact assessments include, among other things, a description of the activity, a description of the affected environment, alternatives, and measures taken to mitigate the impact of the proposed activity); Environmental Impact Assessment Decree No. 86 of 1992, § 3(1) (Nigeria) (mandating that environmental impact assessments identify and study significant environmental issues before the start of any project); Environmental Impact Assessment Regulations (Uganda).

252. *See, e.g.*, Environment Management Act, No. 23 of 1996; National Environment Management Act, No. 13 of 1994, § 22(3) (Gambia); Environmental Protection Act, No. 34 of 1991, § 13(18), as amended by EPR Amendment No.11 of 1993 (Mauritius).

253. *See, e.g.*, Gambia Environment Act, § 9 (establishing the National Environmental Agency as the responsible agency for managing the environment and for coordinating all government activities relating to the environment).

254. *See* Deoraj Caussy et al., *Health Impact Assessment Needs in South-East Asian Countries*, 81 BULL. WORLD HEALTH ORG. 439, 439 (2003) (reporting that from 1994 to 1998, environmentally linked diseases caused thirty to forty million deaths in nine countries in South-East Asia).

important aspects of health impact assessments.[255] In this context, environmental impact assessments have increased linkages with the protection of health. While health issues are covered in some EIA legislation, there is evidence that some of the projects lack a health impact assessment.[256] While the health sector has an important role in national environment management, its role in EIA may be marginal. Furthermore, in most developing countries, the existing environmental legislation does not adequately address the health dimension of EIA. The institutional framework for managing the conduct of EIA, including the approval of plans and projects, lacks streamlined vision that integrates health issues into EIAs. Moreover, project proposals may lack the required tools to integrate public health analysis in such activities. Developing countries lack the technical expertise to conduct health impact assessments within the frameworks of EIAs. The human health component of an EIA is not generally undertaken by a health professional, but rather by an environmental or social scientist, further diminishing the consideration of health.[257] The lack of coordination between the health and environment sectors extends to the conduct of environmental impact assessments and this undermines health components of EIAs. However, even when health aspects are addressed, EIAs tend to focus only on the negative effects of changes in the (bio)physical environment and ignore the effects of modifications on other health determinants, such as socio-economic ones and the possibility of promoting health benefits, even though health is dependent on both environmental and socio-economic determinants.[258]

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255. *See id.* at 441.

256. *See* Richard K. Morgan, *Health Impact Assessment: The Wider Context*, 81 BULL. WORLD HEALTH ORG. 390, 390 (2003) (discussing recent trends in impact assessments). Morgan notes that the wider context of impact assessments must be understood in order to build upon the existing knowledge base, rather than perpetually "reinventing" the process. *Id.*

257. *See generally* Caussy et al., *supra* note 254, at 442 (explaining that even when health is included in the EIA it is not always a complete assessment of the impacts of the proposed project). Health impact assessments also must encompass a variety of sections of the government outside of the health ministries in order to be fully effective. *Id.*

258. *See* Roy E. Kwiatkowski & Maria Ooi, *Integrated Environmental Impact Assessment: A Canadian Example*, 81 BULL. WORLD HEALTH ORG. 434, 437

However, owing to the general recognition of a health impact assessment as a missing link in an environmental impact assessment, many developed countries have established legal and institutional frameworks for integrated environmental impact assessment.[259] An integrated EIA combines health, social, economic, cultural, and psychological well-being, as well as the physical, biological, and geochemical environments, and provides a holistic understanding of the complex interrelationships between the human and natural environments that are key to human health.[260] A number of developing countries have begun to integrate health impact assessments within their existing EIA frameworks.[261]

Furthermore, the concept of what is known as Strategic Environmental Assessment ("SEA") has also emerged. SEA is a process used to evaluate the environmental consequences of proposed projects early on in the decisionmaking process in order to fully consider all of the consequences of a project.[262] The United

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(2003) (recognizing that the cost of performing a more thorough EIA that includes all potential harms and benefits to society could actually cost less than contending with the unforeseen consequences of a project); *see also* Yoshiharu Fukuda et al., *Wide Range of Socioeconomic Factors Associated with Mortality Among Cities in Japan*, 19 HEALTH PROMOTION INT'L 2, 177-78 (2004), *available at* http://heapro.oxfordjournals.org/cgi/content/full/19/2/177 (discussing the necessity of a multi-sectoral health policy in order to improve the health of the population).

259. *See, e.g.*, Kwiatkowski & Ooi, *supra* note 258, at 434 (examining the Canadian process for EIA, which requires a differing level of assessment depending on the severity of environmental impact).

260. *See id.* at 435 (explaining that the Canadian EIA regulation requires the project planner to prepare the assessment report and the Canadian government to review the report and decide if the project is allowed to go forward).

261. *See* Caussy et al., *supra* note 254, at 442 (stating that in India, Thailand and Indonesia, health impact assessments have been promoted and integrated as part of EIA using existing legislation, guidelines and EIA methods).

262. *See* M.R. Partidario, Strategic Environmental Assessment—Principles and Potential, *in* I HANDBOOK OF ENVIRONMENTAL IMPACT ASSESSMENT: ENVIRONMENTAL IMPACT ASSESSMENT: PROCESS, METHODS AND POTENTIAL 60-73, 63 (J. Petts ed., 1999) (articulating two suggested definitions of SEA); *see also* Environment Management Act, No. 5 of 2002, § 31(2)(a) (Swaziland), *available at* http://www.elaw.org/resources/text.asp?ID=2480 (defining strategic environmental assessment as "an assessment of the positive and adverse effects that implementation of legislation or of a public policy, programme, or plan is likely to have on the enhancement, protection, and conservation of the environment and on the sustainable management of natural resources").

Nations Economic Commission for Europe,[263] the European Union,[264] and some developing countries[265] have adopted instruments to implement SEAs.

E. NATIONAL INSTITUTIONS FOR THE ENVIRONMENT

International environmental conventions require national policy and legislative action to implement them, including the establishment of focal points or national institutions for the environment.[266] One of the key actions in developing countries is the move to establish national institutions for the environment.[267] The development of environmental protection in developing countries has involved the establishment of separate national institutions or ministries of the

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263. *See* Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context, pmbl., opened for signature May 21, 2003, MP.EIA/2003/1, *available at* http://www.unece.org/env/eia/documents/protocolenglish.pdf (recognizing the importance of strategic environmental assessments in promoting health and establishing guidelines for when Parties to the Protocol must conduct strategic environmental assessments).

264. *See* Council Directive 2001/42, art. 1, 2001 O.J. (L 197) 30 (EC) (providing for environmental protections and promoting sustainable development by mandating that an environmental assessment is carried out for programs that likely have significant effects on the environment).

265. *See, e.g.*, Environment Management Act, § 31(1); National Environmental Management Act 107 of 1998 ss. 2(4)(a)(i), 24(3), 24(4)(b)(i), 24(7) (S. Afr.) (granting the Minister authority to develop regulations in order to protect "the environment, socio-economic conditions, and cultural heritage"). While this Act focuses on the environment, it extends to include an assessment of the impact on socio-economic conditions. Health is thus included in this regard.

266. *See, e.g.*, Basel Convention, *supra* note 105, art. 5, 28 I.L.M. at 664 (mandating that parties to the convention designate one competent authority to receive notification and to inform the Secretariat which agencies they designated as focal point within three months).

267. *See, e.g.*, Environmental Protection Agency Act, No. 490 of 1994, pt. I (Ghana) (establishing for the Environmental Protection Agency which is responsible for coordinating the activities of bodies concerned with the technical or practical aspects of the environment, to serve as a channel of communication between bodies, and to collaborate with foreign and international agencies); Environmental Management Act, No. 3 of 2000, §§ 6, 16 (Trin. & Tobago), *available at* http://www.ema.co.tt/docs/legal/cur/Act_3_of_2000.pdf (authorizing an Environmental Management Authority to undertake all environmental management and policy development activities in Trinidad and Tobago).

environment.[268] This has meant that core environment management has been devolved to one ministry or institution that coordinates environmental protection activities of the government. This has centralized the formerly fractious nature of environmental governance and also enhanced the "command and control" type of environmental governance that was inherited from the colonial era.[269] However, this has also centralized standard setting in many aspects of environmental protection. As the public health and environmental sectors continue to be specialized, environmental decisionmaking can be fractured, especially where economic issues may be at odds with human health concerns. Commentators opine that the semi-autonomous bodies created for environmental management have mandates that are inevitably development related and fail to address "ancillary" matters such as agricultural resources, wildlife, and public health.[270] While multi-sectoral approaches to environmental protection have been strengthened in many countries to offset any weaknesses of this approach, this has not yet adequately incorporated public health protection goals. In fact, it is common to exclude public health perspectives from key environmental decisions.[271]

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268. *See* William L. Andreen, *Environmental Law and International Assistance: The Challenge of Strengthening Environmental Law in the Developing World*, 25 COLUM. J. ENVTL. L. 17, 21-22 (2000) (noting that the 1987 World Commission on Environment and Development advocated for establishing environmental agencies within developing countries and recognized that international donor organizations would be needed to provide additional assistance to help support such environmental institutions).

269. *See* Richardson, *supra* note 230, at 24 (articulating that a "command and control" style of government management impedes the modernization of environmental legislation).

270. *See, e.g.*, Wilbert T.K. Kaahwa, *Towards Sustainable Development in the East African Community*, *in* INTERNATIONAL LAW AND SUSTAINABLE DEVELOPMENT: PRINCIPLES AND PRACTICE 631, 639 (Nico Schijver & Friedl Weiss eds., 2004) (discussing the confined mandates of environmental management institutions in the East African Community).

271. *See, e.g.*, Samuel Mburu, *Authority Rejects Crusade to Lift Ban on DDT*, E. AFR. STANDARD, Aug. 6, 2005, http://www.eastandard.net/archives/cl/hm_news/news.php?articleid=26866 (describing the National Environment Management Authority's decision to reject the reintroduction of DDT to curb malaria as permitted by the Stockholm Convention on Persistent Organic Pollutants); Jennifer Austin, *Uganda Clings on to DDT for Malaria*, NEW VISION, Sept. 15, 2006, http://www.newvision.co.ug/D/8/459/455871/ (last visited Apr. 7, 2006) (showing a similar row continues in Uganda where attempts by the Ministry of Health to

Moreover, environmental institutions or ministries may be newer entities that lack the resources, expertise, and legal framework to promote the broader goals of sustainable development that includes health as a key component. Addressing sectoral environmental concerns is a legal requirement of international treaties, but these need to be integrated into the broader environment and sustainable development agenda that can include aspects of health protection.[272] Institutional bottlenecks can result into uncoordinated action that may cause critical development decisions to be undertaken without substantive inputs from the health and environment sectors. In fact, as Satterthwaite has put it, a failure of environmental governance underlies most environmental problems, including the failure to strengthen the capacity of national, local, city authorities, and NGOs on matters of the environment.[273]

While recognizing that complicated and overlapping institutional arrangements are bureaucratic and lead to competition over jurisdiction, bad planning, and inefficient use of resources, it is also important that environmental management requires diverse sectoral participation. In fact, the diversity and complexity of the various environmental concerns that have a significant relevance for public health requires participation of the health sector alongside other sectors involved in environmental management. While national environmental laws provide frameworks for coordinated action, the practical effect and functioning of such frameworks is unclear.[274]

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control the malaria epidemic continue to be challenged by the external and internal environmental lobby).

272. *See* VON SCHIRNDING, *supra* note 246, at 27.

273. *See* David Satterthwaite, *The Links Between Poverty and the Environment in Urban Areas of Africa, Asia, and Latin America*, 590 ANNALS AM. ACAD. POL. & SOC. SCI. 73, 90 (2003) (noting that international agencies often consider problems with sanitation and healthcare in urban areas low priorities). The creation of democratic, accountable, effective, and innovative urban authorities and the national frameworks to guide such authorities are essential aspects of environmental governance. *Id.* Satterthwaite also notes that environmental policies must include a method to limit the transfer of environmental costs to people and ecosystems beyond the borders, in addition to addressing the health effects of environmental projects. *Id.*

274. *See, e.g.*, National Environmental Management Act 107 of 1998 ss. 7-10 (S. Afr.) (creating a Committee for Environmental Coordination, which includes a the Health Director-General as a member); Environmental Protection Act, No. 34 of 1997, § 3 (Pakistan) (establishing the Pakistan Environmental Protection

The case in Uganda provides an insight into the strengths and challenges relating to interagency coordination for environmental management. In Uganda, the National Environment Management Authority ("NEMA") is the lead agency charged with activities to implement international environmental obligations. NEMA works with a number of lead agencies in the accomplishment of this task and the Health Ministry is one such agency on the Policy Committee.[275] The National Environment Act defines a lead agency as "any ministry, department, parastatal agency, local government system or public officer in which or whom any law vests functions of control or management of any segment of the environment."[276] The Act mandates that NEMA coordinate with relevant lead agencies in order to integrate environmental aspects of governmental planning with overall national governmental planning.[277] The Act also requires each lead agency charged with the management of any segment of the environment to report on the state of that segment of the environment and the measures taken by the lead agency to maintain or improve the environment.[278] Pursuant to this, the Uganda Ministry of Health is principally involved with providing input into health related aspects of environmental protection in Uganda.

There are some challenges relating to the lead agency role of the Health Ministry within overall environmental governance in the country. Foremost, the Health Ministry is one of a number of sectoral

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Council, including medical professionals as members); National Environment Management Act, No. 13 of 1994, §§ 5-6 (Gambia) (developing the National Environment Management Council, including the Minister responsible for health and social welfare); Environmental Protection Act, No. 34 of 1991, § 4(8), as amended by EPR Amendment No.11 of 1993 (Mauritius) (establishing a National Environment Commission and the Environmental Advisory Council respectively, and through the second and fourth schedules to the Act, including the Health Ministry as a member among the many other sectors); Environmental Agency Decree No. 58 (1988) s. 1 (Nigeria) (creating the Federal Environmental Protection Agency, whose membership includes experts appointed by the Health Ministry).

275. *See* National Environment Statute, §§ 7-8, LXXXVIII Uganda Gazette 21 Supp. (1995) (mandating that NEMA must coordinate Policy Committee recommendations with governmental policy concerning the environment).

276. *Id.* § 2 .

277. *Id.* § 7(1)(a).

278. For an example of an implementing regulation, see the Environmental Impact Assessment Regulations, S.I. 1998/13, § 108 (providing for a wide role of the lead agency).

units with a degree of responsibility for environmental management,[279] and there is bound to be competition for resources, technical assistance, and influence. Secondly, while the NEMA Statute affirms the responsibility of the lead agencies to manage the segments of the environment within their jurisdiction, in practice coordination between the agencies is always a challenge. The case of the implementation of the Stockholm Convention on Persistent Organic Pollutants in Uganda regarding the use of dichlorodiphenyltrichloroethane ("DDT") has shown the challenges of institutional coordination.[280] Invoking the explicit legal basis in the Stockholm Convention for disease control in developing countries,[281] the Ugandan Ministry of Health decided to commence indoor spraying of DDT. The Minister of Health stated that Uganda loses 347 million dollars annually to malaria and Ugandan families spend ten percent of their incomes on malaria coupled with continuing mortality.[282] DDT would counter this public health threat. Despite its classification as a persistent organic pollutant, DDT remains a cost-efficient and useful insecticide.[283] However, the National

279. *See* National Environment Statute, § 1 (articulating the membership of the Policy Committee). The Policy Committee consists of the Prime Minister, as well as the ministers for natural resources, agriculture, finance, education, health, land, housing, local government, gender, tourism and trade.

280. *See generally* von Schirnding et al., *supra* note 7, at 971 (noting that the Stockholm Convention requires member states to phase out DDT except for public health purposes, such as malaria control).

281. Stockholm Convention, *supra* note 107, Annex B pt. II, 40 I.L.M. at 554-56 (mandating that States parties who opt to continue the use of DDT are only permitted to use it for disease control purposes). The Convention also articulates specific guidelines that States must follow in using DDT for disease control. *Id.* Annex B § 5(a). States must develop a plan for the use of DDT that includes regulatory mechanisms to ensure DDT is only used for disease control, the use and implementation of alternatives to DDT, and actions taken to increase healthcare and reduce incidence of vector diseases such as malaria. *Id.*

282. *See* Charles Wendo, *Uganda Considers DDT to Protect Homes from Malaria*, 363 LANCET 1376, 1376 (2004) (reporting that, according to the WHO, malaria kills one African child every thirty seconds and the average Ugandan child fights a malaria infection six times per year).

283. *See id.* (explaining that the Ugandan government would like to move to cheaper and more cost-effective means of combating malaria, such as the use of DDT in homes); *see also* H. Towson et al., *Exploiting the Potential of Vector Control for Disease Prevention*, 83 BULL. WORLD HEALTH ORG. 942, 942-43 (2005) (affirming the importance of vector control to restrain malaria).

Environmental Authority, which is the designated national institution, continues to insist on a thorough study, conducting an environmental impact assessment, consulting widely, and considering all alternatives before they can make any decision at all on the DDT.[284] This existed despite the fact that the Health Ministry argued that the Stockholm Convention makes clear the applicable provisions by referring to WHO Guidelines as the standard for application of DDT for malaria control. The internal and external environmental advocates continue to vehemently oppose the use of DDT in Uganda. As one has put it, the objection of environmental NGOs to use of DDT for malaria control contradicts their touted commitment to environmental justice and the public good.[285]

Kenya's National Environment Management Authority also declared that it does not support the use of DDT for malaria control in Kenya.[286] The opposition to DDT exists despite the fact that countries such as South Africa and Zambia have successfully used it to counter malaria.[287] Furthermore, the case in Uganda and Kenya also shows the problems of centralized command and control approaches to environmental management by one core institution where evidence and views of sectoral units such as the Health Ministry can be disregarded.[288] Finally, under common law, one

284. *See* Wendo, *supra* note 282, at 1376.

285. *See* Andrew P. Morriss & Roger E. Meiners, *Property Rights, Pesticides, & Public Health: Explaining the Paradox of Modern Pesticide Policy*, 14 FORDHAM ENVTL. L.J. 1, 50 (2002) (arguing that the discontinued use of DDT in malaria-prone countries is due to indifference on the part of environmental groups who pushed for the elimination of DDT to the detriment of the world's poorest people).

286. *See* Mburu, *supra* note 271 (reporting that the Director General of Kenya's NEMA recommended using pyrethrum insecticides as a safe alternative to DDT). The Director General opposed lifting the ban on DDT because it is not "biodegradable." *Id.*

287. *See* Richard Tren & Philip Coticelli, *How DDT Can Stop Millions of African Deaths*, MAIL & GUARDIAN ONLINE, Nov. 9, 2005, http://www.mg.co.za/articlePage.aspx?articleid=256050&area=/insight/insight_africa/# (noting that South Africa's discontinuation of DDT in 1996 in order to comply with WHO regulations caused one of the worst outbreaks of malaria in South Africa's history).

288. *See, e.g.*, Wendo, *supra* note 282, at 1376 (articulating the competing views of the Health Ministry and the Natural Resources Parliamentary Committee on the use of DDT in Uganda). NEMA has found itself in the middle of conflicting viewpoints and has articulated that it will study DDT use, much to the chagrin of both sides. *Id.*; *see also* William L. Andreen, *Environmental Law and International*

should be free to spray inside one's house to reduce the risk of malaria and indoor spraying should not inflict injury on a neighbor's property.[289] Yet, possible personal health protection is being denied because of the insistence of a centralized environmental institution to regulate activities on personal property. Despite the intervention of the WHO and other public health actors to counteract malaria, the disease continues to exert its toll on populations in developing countries, particularly the children.[290] In fact, contrary to the stand in Uganda, in 2004 Africa Health Ministers resolved to intensify efforts to use DDT on the continent for malaria control.[291] The case of the use of DDT shows the challenges of domestic environmental governance in the efforts to promote public health.

Therefore, in view of the ever increasing public health threats in developing countries, national environmental governance should provide for the active involvement of other sectoral units of government if it serves to promote health. At the local and rural levels, decentralized community health structures in developing countries have evolved over time. These infrastructures can serve to advance both environment and health governance and goals. Communities in developing countries have a role to play in counteracting the challenges of unsafe water, malaria, indoor smoke, and urban pollution, among others.

Assistance: The Challenge of Strengthening Environmental Law in the Developing World, 25 COLUM. J. ENVTL. L. 17 (2000) (stating that sectoral environmental coordination in developing countries is often an immense challenge).

289. *See* Rylands v. Fletcher, (1868) 3 L.R. 330, 339-40 (H.L.) (reflecting the old common law rule that, "the person who, for his own purposes, brings on his land and collects and keeps there anything likely to do mischief if it escapes, must keep it at his peril, if he does not do so, is *prima facie* answerable for all the damage").

290. *See* UNICEF, Disease, Millennium Development Goals—6. Combat HIV/AIDS, Malaria, and Other Diseases, http://www.unicef.org/mdg/disease.html (last visited Apr. 7, 2006) (recognizing that children under five in developing countries are disproportionately affected by malaria in comparison to the adult population, with ten percent of childhood deaths resulting from the disease).

291. *See* East Central & Southern African Health Community, *Report of the 40th Regional Health Ministers' Conference*, Res. 1, Nov. 1-5, 2004, RHMC 40/R1 (noting that DDT is effective for preventing malaria outbreaks and that affected States have limited resources for prevention, control, and treatment).

F. HEALTH AND ENVIRONMENTAL PROTECTION, THE ROLE OF HEALTH MINISTRIES

The Ministry of Health is the institutional focal point in government responsible for health matters, including environmental health, though variations exist across developing countries.[292] The Ministry is responsible for raising awareness on environmental health laws, strengthening the linkages in environment and health, and developing environmental health laws. This mandate may also extend to powers and authority to ensure enforcement of environmental legislation within the purview of its mandate. The Ministry of Health also plays a coordinating role in the core environmental management of government.[293] In many developing countries, public health legislation continues to form the corpus of domestic environmental legislation.[294] An insight into these laws can reveal that they could further environmental protection goals in developing countries. The shortcoming of public health statutes are

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292. *Compare Minister of Health & Welfare v. Woodcarb (Pty) Ltd.* 1996 (3) SA (NP) 155 (S. Afr.), *reprinted in* I COMPENDIUM OF JUDICIAL DECISIONS ON MATTERS RELATED TO ENVIRONMENT 102, *available at* http://www.unep.org/padelia/publications/Jud.Dec.Nat.pre.pdf [hereinafter JUDICIAL DECISIONS COMPENDIUM] (emphasizing that the South African Ministry of Health maintains primary responsibility for the administration and enforcement of laws protecting citizen's environmental health), *with* Mark A Drumbl, *Does Sharing Know Its Limits? Thoughts on Implementing International Environmental Agreements: A Review of National Environmental Policies, A Comparative Study of Capacity-Building*, 18 VA. ENVTL. L.J. 281, 290 (1999) (explaining that the Netherlands, a developed nation, distributes environmental protection power to local municipalities, rather than vesting supreme power in national government institutions like the Ministry of Health).

293. *See, e.g.*, Environmental Protection Act, No. 34 of 1991, § 13(18), as amended by EPR Amendment No.11 of 1993, §§ 4, 8 (Mauritius) (establishing the National Environment Commission and the Environmental Advisory Council, and listing the Health Minister as a member of both agencies); Environmental Agency Decree No. 58 (1988) s. 1 (Nigeria) (creating the Federal Environmental Protection Agency). The Health Minister is a member of the governing council for the agency. *Id.* s. 2.

294. Laurence Juma, *Environmental Protection in Kenya: Will the Environmental Management and Co-ordination Act (1999) Make a Difference?*, 9 S.C. ENVTL. L.J. 181, 212-13 (2002) (explaining that in Kenya the Public Health Act is utilized to assure a clean water supply, rather than a strictly environmental legal provision). Kenya only recently passed comprehensive environmental legislation in 1999. *Id.* at 181.

that many are obsolete and enacted before the major global environmental concerns gained prominence.[295] However, the health sector may face challenges in fully participating in national environmental governance. Firstly, health ministries are routinely devoted to the management and enactment of health care services and policies. As one commentator put it, "environmental health is not always appropriately addressed in the broader public health enterprise. 'Health features secondary to environmental exposures are not being given the priority needed. . . . The priority is more on infectious disease, health care delivery, [and] occupational health.'"[296]

Secondly, health ministries are not proactive in engaging in environmental management.[297] This is in part due to the chronic lack of multisectoral synergy and coherence among executive institutions in many developing countries.[298] Governmental departments usually

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295. *See* Kaahwa, *supra* note 270, at 640 (asserting that sectoral environmental statutes in East Africa are out of date because they promote the utilization of resources for economic gain and survival, rather than the sustainability of the environment); *see also* Consultancy Report for the African Youth Alliance-Uganda, *Review of Laws, Policies, Strategies and Guidelines Relevant to Adolescent Sexual Reproductive Health and HIV/AIDS*, 8-9, 2001, *available at* http://www.ayaonline.org/11-05CD/WebDocs_CDs/Countries/Uganda/UG-LawPolicyReview.pdf (describing the Ugandan Public Health Act of 1964 as outdated and desperately in need of review).

296. Harvey Black, *Environmental and Public Health: Pulling the Pieces Together*, ENVTL. HEALTH PERSPECTIVES, Nov. 2000, at A512, A513 (quoting Samuel Wilson, Deputy Director of NIEHS).

297. *See* Andreen, *supra* note 268, at 30 (arguing that institutions like the Health Ministry are generally ineffective because ambiguous grants of authority lead to poor planning and uncertainty regarding jurisdictional power); *see also* Interview with Friday Edson Agaba, Head of Environmental Health in the Ministry of Health, Uganda (July 13, 2005).

298. *See* Andreen, *supra* note 268, at 30-31 (finding that the lack of communication amongst environmental agencies leads to inconsistent and sometimes overlapping implementation of health and environmental measures); *see also* Benjamin Richardson, *Environmental Law in Postcolonial Societies: Straddling the Local-Global Institution Spectrum*, 11 COLO. J. INT'L ENVTL. L. & POL'Y 1, 46 (2000) (explaining that lack of coordination among agencies hurts the effectiveness of legal and institutional frameworks for environmental management).

protect their own sectoral interests, mandates, and funding.[299] As a result, environmental and health jurisdictional boundaries become blurred and health and environment matters remains in an incoherent legal and political limbo. According to another commentator:

> [E]nvironmental factors that affect health . . . must be considered when public health policy decisions are being made. "The world of public health has a lot of the health expertise and data, but not much environmental expertise. . . . The environment has been taken out of public health and put into environmental agencies, and environmental agencies have lost touch with health."[300]

However, there are early signs of change where multi-sectoriality involving the health and environment sectors is an evolving feature of national environmental management. For example, in Uganda, environmental health staff of the Ministry of Health receives environmental training as environmental inspectors.[301] The Ministry of Health actively participates in Environmental Impact Assessment Reviews and there is a memorandum of understanding between the National Environmental Authority and the Ministry of Health.[302] However, policy implementation is hampered by lack of financing due to budgetary constraints and environmental operations follow donor and other patterns of funding and technical assistance.[303] When available funding and technical assistance are directed through the Environment Ministry, it is possible that the health component of such projects may be overlooked or under-supported technically and

299. *See* Andreen, *supra* note 268, at 30-31 (reasoning that interorganizational rivalries are caused by overlapping grants of authority and compounded by ill-advised reforms that inadvertently favor one institution over another).

300. Black, *supra* note 296, at A513-14 (quoting Lynn Goldman, Visiting scholar at Johns Hopkins School of Public Health).

301. Interview with Friday Edson Agaba, *supra* note 297.

302. *See* National Environment Statute, §§ 2, 7(b), LXXXVIII Uganda Gazette 21 Supp. (1995) (requiring lead agencies to cooperate with NEMA in areas of environmental management under their jurisdiction).

303. *See* Kaahwa, *supra* note 270, at 641 (focusing on the budgetary constraints that prevent East African countries from meaningfully addressing their environmental problems).

financially.[304] In such circumstances, the integration of a health agenda into an environmental mandate for a national institution is weak.[305] Yet, the health sector can play a catalytic role in effective environmental governance, including the effective implementation of environmental laws and policies and contributing to the protection of public health.[306] While health ministries in developing countries are often regarded as the weaker sector, they possess the health expertise and scientific knowledge in environmental health matters.[307]

The South Africa Health Ministry, for example, has responsibility on matters of implementation of national environmental health norms and standards. The National Health Act regulates national health and provides uniformity in respect of health services by "protecting, respecting, promoting and fulfilling the rights of the people of South Africa to an environment that is not harmful to their health or well-being."[308] The Act promotes international cooperation in environmental health matters.[309] The Act also establishes an Office of Standards and Compliance to carry out inspections. Health officers are appointed to monitor and enforce compliance with the Act including the environmental health provisions.[310] In this connection, a health officer must cite those responsible for health nuisances and conditions that violate the constitutional right to health.[311] For example, the health officers have been responsible for enforcing the

304. *See* Andreen, *supra* note 268, at 55-60 (reporting that environmental statutes and policies are often narrowly tailored toward the management of a specific resource, and therefore do not adequately address the health component of environmental management); *see also* Interview with Friday Edson Agaba, *supra* note 297.

305. *See* Andreen, *supra* note 268, at 56 (indicating that centralized environmental ministries are exclusively devoted to environmental activities); Interview with Friday Edson Agaba, *supra* note 297.

306. *See generally* Interview with Friday Edson Agaba, *supra* note 297.

307. *Id.*

308. National Health Act. 61 of 2003 s. 2(c)(ii) (S. Afr.)

309. *Id.* ss. 21(2)(a)-(l) (requiring that the Director-General coordinate with international health agencies and health departments in foreign countries).

310. *Id.* ss. 80-82 (instructing the Minister to hire health officers charged with enforcing provisions of the Act).

311. *Id.* s. 83 (granting health officers the power to enter any public dwelling while investigating potential health nuisance).

South African Tobacco Control legislation that has extensive environmental health provisions.[312]

The South African Health Ministry has also been proactive in the judicial enforcement of environmental law in order to protect public health and the environment.[313] In the *Minister of Health & Welfare v. Woodcarb (Pty) Ltd.*, a South African court upheld the *locus standi* of the Minister of Health and Welfare to seek an Order requiring a saw mill to cease emission of noxious gases. [314] In granting the standing, the court recognized the Minister's administrative responsibilities, as well as the right to seek redress for actions that infringed upon a citizen's right to an environment that is not detrimental to health and well-being under the interim Constitution of the Republic of South Africa.[315] The court held that the defendant's unlicensed emission illegally interfered with the neighbors constitutional right to a healthy environment.[316] The importance of this decision is that it confirms the Minister's ability to take proactive steps to control air pollution from scheduled processes, rather than relying on the cumbersome, reactive procedure of criminal prosecution that provided for a paltry fine and was easily

312. *See* Tobacco Products Control Act 12 of 1999 (S. Afr.) (banning smoking in public places and at work because of the detrimental environmental health consequences).

313. *See generally Minister of Health & Welfare v. Woodcarb (Pty) Ltd.* 1996 (3) SA (NP) 155 (S. Afr.) (reporting that the South African Health Ministry successfully enjoined a citizen from incinerating wood products on his property because the resultant ash adversely affected public health and the environment).

314. *Id.* at 164 (holding that the Ministry of Health has standing to seek injunctions against citizens who violate the Atmospheric Pollution Prevention Act).

315. *Id.* (reasoning that Section 7(4)(b)(iv) of the South African Constitution confers standing to the Ministry because the pollution deprived neighbors of their constitutional right to a healthy environment); *see also* S. AFR. CONST. art. 24 ("Everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that, prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.").

316. *Woodcarb (Pty) Ltd.* (3) SA at 164 (reasoning that the pollution violated the provisions of the Atmospheric Pollution Prevention Act and Section 29 of the South African Constitution).

written off as a cost of operation.[317] The implication of this case for other developing country's health ministries is that preventive administrative and legal action, including court action, needs to be considered a routine function of the ministries of health on matters of national environmental governance. In this connection, the South African Health Act promotes enforcement of environmental health and can contribute to strengthening domestic environmental governance.

Therefore, developing countries need to strengthen their Health Ministry's scientific and legal capacity to proactively contribute to domestic environmental governance. Effective capacity building requires both vertical and horizontal linkages, involving ministries, local governments, nongovernmental organizations and international agencies. One way is for the ministries of health to develop environment and health action plans. This can provide a progressive framework to enhance participation and a cross-sectoral dialogue enabling health to be a key issue in domestic environmental protection.

G. CAPACITY BUILDING, FINANCIAL AND TECHNICAL ASSISTANCE

Mechanisms enshrined in environmental agreements for provision of technical, financial, and capacity building can promote health programs in developing countries. Environmental treaties usually include such support mechanisms. Capacity building reinforces often weak domestic compliance mechanisms that could otherwise nullify international environmental obligations.[318] In some treaties, the domestic implementation of an international obligation by developing nations revolves around the provision of financial resources and technology transfer by developed States parties.[319]

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317. *Id.* at 159-61 (accepting the Ministry's argument that the small and ineffective fines for violation implictly suggest that the Ministry may bring injunctions to swiftly stop acts of environmental pollution).

318. *See* Michael Holley, *Sustainable Development in Central America: Translating Regional Environmental Accords into Domestic Enforcement Action*, 25 ECOLOGY L.Q. 89, 111 (1998) (recognizing that environmental agencies throughout Central America lack the monetary capacity, legal mandate, and political will to enforce their international environmental obligations).

319. *See* WHO Framework Convention on Tobacco Control, arts. 2-3, 6-7, May 21, 2003, WHO Doc. WHA56.1 [hereinafter Tobacco Framework] (calling for

Despite such provisions, environmental governance in many countries is bedevilled by lack of capacity in both the environment and health sectors.[320] This thwarts efforts of both sectors to promote human health. Moreover, the lack of professional and scientific capacities in developing countries has prevented their enforcement of environmental legal regimes.[321] In reality, less developed countries do not have the technical and professional capabilities to enforce and evaluate the treaties provisions.[322] For example, countries cannot effectively enforce quality standards for industrial emissions and effluents because they do not have the scientific and technical resources to monitor infringement.[323] Furthermore, environmental management agencies in developing countries lack health expertise,[324] and coordination between environmental ministries and health ministries is often less effective.[325] Environmental health matters that require scientific evidence may not be easily dealt with by an environmental authority. Thus, capacity building activities helps to fully integrate health concerns in the environmental agenda. It is important to note that public health structures in many

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international cooperation and open transfer of expertise and financial assistance to developing countries); *see also* Stockholm Convention, *supra* note 107, art. 12(2) (requiring parties to provide technical assistance to developing countries); Rotterdam Convention, *supra* note 106, art. 16 (instructing parties to provide technical assistance to countries with less developed infrastructure and capacity to manage chemicals).

320. *See* Parvez Hassan, *Environment and Sustainable Development: A Third World Perspective*, 31 ENVTL. POL'Y L.J. 36, 36-42 (2001).

321. *See id.* at 37.

322. *See id.* at 40 (stating that developing countries need professional environmental lawyers and experts to draft, monitor, and enforce international environmental protection laws).

323. *See id.* (observing that the environmental protection agencies established by treaty cannot monitor quality standards because they lack the necessary equipment and technical resources).

324. *See* Andreen, *supra* note 268, at 56 (recounting how environmental ministries do not focus on public health issues, rather they exclusively concentrate on environmental topics); *see also* WHO & UNEP, HEALTH AND THE ENVIRONMENT: TOOLS FOR EFFECTIVE DECISION-MAKING 8 (2004), *available at* http://www.who.int/heli/publications/helirevbrochure.pdf (stating that the primary barriers to a more effective policy are "economic, institutional, political and social").

325. *See* Andreen, *supra* note 268, at 30-31.

developing countries have been decentralized to the cities, districts, and regions and have served to promote environmental health.[326] However, the capacities of local government units for environmental protection have not been enhanced in many developing countries.[327] Capacity building also requires vertical cooperation (among levels of government) and horizontal cooperation (among departments and ministries within each level of government).[328] These aspects of capacity building are also key to enhancing public health in the national implementation of international environmental commitments.[329] Environmental health and public health training for environmental inspectors, raising public awareness on the linkages between health and the environment, and research development are important aspects of capacity building that could enhance health protection in domestic environmental management. Therefore, extensive sectoral capacity building is required to strengthen environmental policies, practices within the environmental sectors, and practices and policies in the health sector.

H. CONSTITUTIONAL LAW AND THE ROLE OF THE COURTS

1. Introduction

An independent judiciary in developing countries has shown a high potential to build the jurisprudence needed to enforce and integrate health related norms into national environmental protection.[330] Environmental justice, which has become well

326. *See* Drumbl, *supra* note 292, at 291 (finding that decentralized environmental institutions can effectively address environmental problems with local effects such as waste management or lack of water supply).

327. *See id.* at 292 (referring to case studies of national environmental policies in Nigeria and other developing countries that reveal a sub-optimal use of local government in the process of environmental capacity building).

328. *See id.* at 291-92 (clarifying that horizontal cooperation includes both internal integration and external integration). Internal integration demands the consistent treatment of environmental issues within the same department, whereas external integration demands consistent treatment of environmental issues throughout different departments and ministries. *Id.*

329. *See id.*

330. *See, e.g.*, Shubhankar Dam, *Green Laws for Better Health: The Past that Was and the Future that May Be—Reflections from the Indian Experience*, 16 GEO.

established in environmental practice, provides an important springboard for health justice and courts and constitutional law are instrumental in making this effective. By emphasizing public health, social inequality, and environmental degradation, environmental justice provides a framework for public policy debates about the impact of discrimination on the environmental health of communities.[331] The right to a healthy environment is controversial, but scholars have attempted to link the environment to human rights.[332] A school of thought believes that no human rights exist without environmental rights. Another school believes no environmental rights exist.[333] Another school believes there is an environmental right based on existing rights such as the right to health and right to information.[334] Despite this controversy, the Stockholm Declaration affirmed that "[m]an has the fundamental right to freedom, equality and adequate conditions of life, in an environment of quality that permits a life of dignity and well-

INT'L ENVTL. L. REV. 593, 606 (2004) (reporting that the judiciary in India enhanced environmental and health protection by holding that the constitutional right to life includes the right to health and a clean environment).

331. *See* Rachel Morello-Frosch et al., *Integrating Environmental Justice and the Precautionary Principle in Research and Policy Making: The Case of Ambient Air Toxics Exposures and Health Risks Among Schoolchildren in Los Angeles*, 584 ANNALS AM. ACAD. POL. & SOC. SCI. 47, 49 (2002) (recognizing that the environmental justice theory raises important questions regarding the patterns of health problems affecting poor communities within the United States); *see also* Robert R.M. Verchick, *In a Greener Voice: Feminist Theory and Environmental Justice*, 19 HARV. WOMEN'S L.J. 23, 24 (1996) (concluding that the environmental justice movement directly challenges environmental policies that benefit wealthy actors at the expense of the most poor and unfortunate members of society).

332. *See* Bruch et al., *supra* note 210, at 143 (recognizing that the development of international environmental law and practice supports the assertion that there is a fundamental human right to a healthy environment).

333. *See id.* at 135.

334. *See id.* at 150-56 (discussing the willingness of the judiciary to find a constitutional right to a clean environment through a right to health). The right to information, when read in conjunction with the right to a healthy environment and the right to life, guarantees citizens access to crucial environmental information. *Id.* at 179-84; *see also* Sumudu Atapattu, *The Public Health Impact of Global Environmental Problems and the Role of International Law*, 30 AM. J. L. & MED. 283, 297 (2004) (noting that three approaches to environmental rights have been made: "recognition of procedural rights in relation to environmental issues; application of existing substantive rights to environmental issues; and the recognition of a distinct right to a healthy environment").

being."[335] While environmental agreements do not contain references to the right to the environment, in fact a number of human rights treaties as well as national constitutions in developing countries do.[336] Some developing countries have an explicit constitutional right to a healthy environment.[337] The discussion below shows a mixed record relating to the implementation of constitutional law, particularly by the courts, to promote health in Africa and Asia.[338] Constitutional provisions discussed include the right to a healthy environment, the right to life, the right to health, the constitutional obligation to protect the environment, and procedural human rights.[339]

2. The Right to a Healthy Environment

An emerging right to a healthy environment favors the protection of public health. This is because such a right is viewed as anthropocentric and ecocentric, supporting environmental protection for both public health and intrinsic or aesthetic reasons.[340] With the evidence of HIV/AIDS undermining community based

335. Stockholm Declaration, *supra* note 62, princ. 1.

336. *See, e.g.*, African Charter on Human and Peoples' Rights, art. 24, adopted June 27, 1981, O.A.U. Doc. CAB/LEG/67/3 rev. 5, *reprinted in* 21 I.L.M. 58 (1982) (guaranteeing all people the right to an environment favorable to their development); Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, art. 11, Nov. 17, 1988, O.A.S.T.S. No. 69 (urging States parties to promote and protect the right to a healthy environment as guaranteed by the Charter).

337. *See* Bruch et al., *supra* note 210, at 162 (finding that over thirty countries in Africa have constitutional provisions providing for the right to a healthy environment).

338. *See generally* BENIMADHAB CHATTERJEE, ENVIRONMENTAL LAWS, IMPLEMENTATION PROBLEMS AND PERSPECTIVES 123-217 (2002) (providing an extensive analysis of the proactive environmental jurisprudence of courts in India).

339. *Id.*

340. *See* Chris K. Mensah, *The Role of Developing Countries*, *in* THE ENVIRONMENT AFTER RIO, INTERNATIONAL LAW AND ECONOMICS 33, 41 (Luigi Campiglio et al. eds, 1994) (stating that at the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, developing countries insisted that the environment should be at the service of human beings, that a right to a healthy environment could delay human development, and that Principle 1 of the Rio Declaration implicitly recognizes the importance of health for human development).

environmental protection, a right to a healthy environment offers an important tool of health protection.[341]

For example, a number of Brazilian cases have applied and affirmed the right to a healthy environment embedded in the Brazilian Constitution.[342] Similarly, the Indian Constitution provides for the protection of health and environment.[343] Thus, in the case of *Rural Litigation & Entitlement Kendra v. Uttar Pradesh*, the petitioner claimed that illegal mining had an adverse effect on the area and damaged the environment.[344] Even though the petitioner failed to establish harm to human health by the mining action, the court issued an order to cease mining operations, stating that the petitioners had the right to live in a healthy environment.[345] The implication of this case is that the protection of the right to a healthy environment can be invoked if an action damages the environment

341. *See* discussion *supra* Part I.C (discussing HIV/AIDS' negative impact on natural conservation measures); *see also* Sumudu Atapattu, *The Right to a Healthy Life or the Right to Die Polluted?: The Emergence of a Human Right to a Healthy Environment Under International Law*, 16 TUL. ENVTL. L.J. 65, 67 (2002) (stating that environmental issues cover a wider range of actors than human rights issues). The right to a healthy environment affords victims of environmental abuse one other means of seeking redress, which complements the ecocentric approach. *Id.*

342. *See* Constituicão Federal (Brazil), *translated in* CONSTITUTIONS OF THE COUNTRIES OF THE WORLD 124 (2004) (declaring under Article 225 that everyone has the right to an "ecologically balanced environment," which is a public good for the people's use and essential for a healthy life).

343. INDIA CONST. arts. 47, 48A (requiring the government to "endeavor" to protect public heath and the environment but not mandating that the government protect public health and the environment). While the Constitution prescribes a fundamental duty to non-state actors, like citizens, to improve and protect the environment, the Constitution does not expressly mandate that citizens do so. *Id.* art. 51A.

344. *See* Rural Litigation & Entitlement Kendra Dehradun v. Uttar Pradesh, A.I.R. 1985 S.C. 652 (India), *reprinted in* I JUDICIAL DECISIONS COMPENDIUM, *supra* note 292, at 275, 275 (announcing that this was the first case in India involving environmental and ecological balance issues and that this case reveals the conflict between industrial development and natural conservation).

345. *Id.* at 275, 277-78 (separating the limestone mining area into three categories, A, B, and C, ordering the mining area comprising category C to be closed down, and permitting the mining areas comprising categories A and B to continue their operations under certain conditions subject to India's mining laws).

despite an apparent lack of proof of harm to human health.[346] The Court's approach is consistent with the precautionary principle and the preventive underpinnings of public health practice.[347] Similarly, in the case of *Minister of Health & Welfare v. Woodcarb (Pty) Ltd.* a South African court allowed the Minister of Health and Welfare to seek an order, requiring a saw mill to halt the emission of hazardous gases.[348] In granting standing, the court took notice of the Minister's administrative role as well, as the right to seek redress for actions that infringe upon a citizen's right to an environment that is not detrimental to health under the South African Constitution.[349] The court concluded that the defendant's unlicensed emissions illegally interfered with the neighbors' constitutional right to a healthy environment.[350]

3. The Right to Life and Domestic Environmental Protection

All developing nations have a constitutional protection for the right to life.[351] Courts in Bangladesh, India, Pakistan and Tanzania

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346. *See id.* at 276 (explaining, however, that in this case environmental and ecological issues arising from the problematic limestone mines significantly impact public health, not only for those individuals residing near the limestone mining location but for all individuals living in India).

347. *See* A DICTIONARY OF EPIDEMIOLOGY 134-35 (John M. Last et al. eds., 3d ed. 1995) (asserting that public health is an effort organized by society to "protect, promote, and restore the people's health" and health programs, services, and institutions that a society establishes function to prevent diseases and meet the population's health needs); *see also* Philippe Grandjean, *Implications of the Precautionary Principle for Primary Prevention and Research*, 25 ANN. REV. PUB. HEALTH 199, 199-200 (2004) (providing that the precautionary principle is premised on the principle that prevention is better than cure and discussing the role of the precautionary principle in public health, which includes balancing public health policy decisions and unrealistic demands for full scientific proof before preventive measures are undertaken).

348. *Minister of Health & Welfare v. Woodcarb (Pty) Ltd.* 1996 (3) SA (NP) at 159-62 (S. Afr.).

349. *Id.* at 164 (noting that the Minister of Health and Welfare also had standing to seek relief based solely on the statutory violation of the Atmospheric and Pollution Prevention Act, unrelated to the South African Constitution).

350. *Id.*

351. *See, e.g.*, INDIA CONST. art. 21 ("No person shall be deprived of his life."); PAK. CONST. art. 9 ("No person shall be deprived of life."); S. AFR. CONST. art. 11 (declaring that "everyone has the right to life"); *see also* Bruch et al., *supra* note

have interpreted the right to life to promote environmental protection.[352] For example, Article 14 of the Constitution of Tanzania provides that, "everyone has the right to life and to the protection of his life by society in accordance with the law."[353] In the case of *Festo Balegele v. Dar es Salaam City Council*, the City Council of Dar es Salaam applied to extend the time to comply with an earlier court order to halt dumping of garbage in a Dar es Salaam suburb.[354] The citizens of this suburb brought a suit against the Dar es Salaam City Council to immediately comply with the said Order.[355] The dump and resulting pollution had caused respiratory problems among inhabitants of the area.[356] In a landmark ruling, the court ordered the defendants to cease dumping garbage in the area and to construct a dumping ground where such dumping would not be a threat to the health of the residents.[357]

Furthermore, India's Constitution provides that, "no person shall be deprived of his life or personal liberty except according to procedures established by law."[358] Several cases in this regard include *L.K Koolwal v. Rajasthan*, where the Indian Supreme Court held that the Authorities of the city of Jaipur violated the right to life of the residents by failing to implement adequate sanitation measures.[359] It affirmed that maintenance of health, the preservation

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210, at 165 (noting that while the construction of the right varies greatly between nations, most constitutions explicitly recognize the "right to life").

352. *See* discussion *infra* Part III.H (discussing cases from Tanzania, India, and Pakistan in which the courts ascribed to the right to life, and a sanitary, healthy, and unpolluted environment).

353. TANZ. CONST. art. 14.

354. Festo Balegele v. DSM City Council, Misc. Civil Cause No. 90 of 1991 (Tanz.), *reprinted in* I JUDICIAL DECISIONS COMPENDIUM, *supra* note 292, at 87, 88 (noting that the site where Dar es Salaam City dumped the waste was not one of the city's five designated dumping sites but a zoned residential area).

355. *Id.* at 87.

356. *Id.* at 90.

357. *Id.* (reasoning that an individual's health and enjoyment of life partially depends on healthy surroundings and that exposing any individual's life to danger or the like, contradicts a person's right to live, which is protected under the Tanzanian Constitution).

358. INDIA CONST. art 21.

359. Koolwal v. Rajasthan, A.I.R. 1988 Raj. 2 (India).

of sanitation, and environmental protection fall within the realm of Article 21 of the Constitution of India that endows persons with the right to life.[360] The Indian Supreme Court made a similar ruling in the case of *Vellore Citizens Welfare Reform v. Union of India*.[361]

The Pakistani Constitution also provides that "no person shall be deprived of life or liberty save in accordance with law."[362] In *In re Human Rights Case*, the Supreme Court of Pakistan, in proceedings filed against industries seeking to dump radioactive waste in the coastal waters, held that dumping could create an environmental hazard and pollution in violation of the constitutional right to life.[363] Furthermore, in *General Secretary, West Pakistan Salt Miners Labour Union v. Director, Industries & Mineral Development*, the Pakistani Supreme Court held that there was an imminent violation of the right to life where citizens' water supplies were in danger of being polluted by nearby mining operations stating that:

> access to water is scarce, difficult or limited, the right to have water free from pollution and contamination is a right to life itself. This does not mean that persons residing in other parts of the country where water is available in abundance do not have such a right. The right to have unpolluted water is the right of every person wherever he lives.[364]

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360. *Id.*

361. Vellore Citizens Welfare Reform v. Union of India, A.I.R. 1996 S.C. 2715, 2721 (India) (discussing life and liberty rights afforded by the Indian Constitution and the constitutional mandate to the state to protect and improve the environment and public health). The Indian Supreme Court determined that a number of tanneries in the State of Tamil Nadu violated citizens' right to life by discharging untreated effluents into agricultural areas and local drinking water supplies. *Id.* at 2716, 2721-22; *see also id.* 2717-18 (imposing pollution fines on certain tanneries to be utilized for compensating affected individuals and restoring environmental damages caused by the tanneries).

362. PAK. CONST. art. 9.

363. *In re* Human Rights Case, P.L.D. 1994 S. Ct. 102 (Pak.), *reprinted in* I JUDICIAL DECISIONS COMPENDIUM, *supra* note 292, at 280, 280 (reasoning that dumped waste materials along the coasts, including nuclear waste, could jeopardize the people's health, environment, and marine life in the region).

364. *See* Gen. Sec'y, West Pak. Salt Miners Labour Union v. Dir., Indus. & Mineral Dev., 1994 S.C.M.R. 2061 (Pak.), *reprinted in* I JUDICIAL DECISIONS COMPENDIUM, *supra* note 292, at 282, 282 (determining that mining operations posed dangers of contamination because such operations could cause cracks,

The mining companies were ordered to take measures to prevent pollution of the drinking water, including the relocation of operations.[365] The Court also appointed a commission with inspection powers to monitor the implementation of the Court's orders and the ability to order further measures to ensure that the drinking water supplies are free of pollution.[366]

The right to life is an important basis to promote health and the environment. Courts have positively ruled on concerns such as pollution, environmental health, and related health concerns.[367] Whether the right to life will expand in many countries as a tool of public health will depend on the doctrine of stare decisis in the common law jurisdictions and whether public interest litigations can evolve in other developing countries.

4. Procedural Rights and Domestic Environmental Protection

International human rights law and national constitutions provide for procedural rights that are instrumental in the protection of human health and the environment.[368] These rights include freedom of association, freedom of information, public participation in decisionmaking processes, and access to justice and judicial review.[369] Countries such as Uganda, South Africa, and Congo have

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punctures, and leakages in the rocks and ravines that would contaminate or dry up the water springs). The Pakistani Supreme Court explained that the right to life under the Constitution entailed an expansive definition and thus, includes the right to have access to unpolluted water. *Id.* at 282-83.

365. *Id.* at 288 (ordering the mining companies to relocate the mouth of the mine to a location at a safe distance from the stream and reservoir immediately within four months of the order).

366. *Id.* (stating that if the commission determined that relocation of the mine mouth was not possible, the Supreme Court would then consider whether mining operations near the springs should be terminated altogether).

367. *See* discussion *supra* Part IV.H (illustrating how high courts from India, Pakistan, South Africa, and Tanzania decide public health issues and rule in favor of the injured petitioners based on their respective constitutional right to life).

368. *See, e.g.*, Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters art. 1, June 25, 1998, 38 I.L.M. 517 (1999) [hereinafter Aarhus Convention]; *see also* Bruch et al., *supra* note 210, at 134-35 (explaining that constitutional procedural rights protect the people's substantive rights to life and a healthy environment).

369. *See* Aarhus Convention, *supra* note 368, arts. 4-9.

provisions on the right to information and hence incorporate relevant international instruments.[370]

The South African Constitution grants *locus standi* to various parties where rights such as the right to life, healthy environment, association, and access to information have been infringed.[371] In the South African cases of *Wildlife Society of Southern Africa v. Minister of Environmental Affairs & Tourism*[372] and *Van Huyssteen v. Minister of Environmental Affairs & Tourism*,[373] courts have upheld the standings of NGOs and citizens to bring action even when an explicit constitutional right of *locus standi* is lacking.[374] Therefore, the right of access to justice, particularly the right to institute an action on behalf of the general public, is a potential mechanism for redressing public health wrongs.

Constitutional provisions offer a strong tool for health and environmental protection in developing countries and courts are instrumental in ensuring their application. However, some

370. For discussion about international instruments such as the Rio Declaration and Aarhus Convention that provide for public participation in environmental decisionmaking, see Bruch et al., *supra* note 210, at 179 (noting that Uganda, South Africa, and Congo have particularly stronger provisions concerning the right to access environmental information than other African countries with similar constitutional provisions). Bruch also notes that the constitutions of Cape Verde, Gambia, Liberia, and South Africa provide for the right to access environmental information. *Id.* These countries allow their citizens to petition public authorities to protect their public participation rights, while Liberia and South Africa also afford their citizens broad participation in decisionmaking processes. *Id.*

371. S. AFR. CONST. art. 7 (providing that the "state must respect, protect, promote and fulfil the rights in the Bill of Rights"). *See generally* Wildlife Soc'y of S. Afr. v. Minister of Envtl. Affairs & Tourism, Case No. 1672/95 I, *reprinted in* I JUDICIAL DECISIONS COMPENDIUM, *supra* note 292, at 91 (explaining that article seven of the South African Constitution affords persons *locus standi*).

372. *Wildlife Soc'y of S. Afr.*, Case No. 1672/95 I.

373. Van Huyssteen v. Minister of Envtl. Affairs & Tourism, 1996 (1) SA 283 (C) (S. Afr.), *reprinted in* I JUDICIAL DECISIONS COMPENDIUM, *supra* note 292, at 59.

374. *See Wildlife Soc'y of S. Afr.*, Case No. 1672/95 at 101 (ruling that an entity like the petitioner, Wildlife Society, has *locus standi* to ask for an order because the State is required to take certain measures to protect the environment and Wildlife Society's main objective is to promote environmental conservation); *Van Huyssteen*, 1996 (1) SA 283 (C) at 60-61 (ruling that three of the petitioners had *locus standi* to ask for an order because their rights and legitimate expectations in the lagoon at issue were affected or threatened by the pollution).

commentators have stated that excessive environmental activism by courts has undermined executive mandates to protect the environment.[375]

I. THE ROLE OF THE CIVIL SOCIETY AND RELATED STAKEHOLDERS

The civil society continues to play a key role in implementation of environmental law in developing countries. Sands identifies the following groups of civil society that have emerged as stakeholders: the scientific community, non-profit environmental groups and associations, private companies and business concerns, legal organizations, the academic community, and individuals.[376] Stakeholders should participate for a number of reasons.[377] Firstly, law and policymaking is a dynamic decisionmaking process reflecting legitimate claims and values of a variety of such actors, hence the inclusion of the input of such actors. Secondly, participation strengthens democratic tenets in society relating to environmental entitlements and rights. Democratic decisionmaking will lead to environmentally friendly policies. Thirdly, stakeholder participation reinforces good governance, an element of sustainable development. Finally, public participation is also a key element in improved environmental management and is beneficial in the formulation and enforcement of decisions regarding the environment.[378]

Agenda 21 requested governments to take legislative measures necessary to enable the establishment by non-governmental

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375. *See, e.g.*, Michael Jackson & Armin Rosencranz, *The Delhi Pollution Case: Can the Supreme Court Manage the Environment?*, 33 ENVTL. POL'Y & L. 88, 88-91 (2003) (discussing the shortcomings of judicial activism in India and arguing that courts attempting to redress violations of human rights at times make decisions that may ultimately harm the nation). By mandating that all government vehicles in the city convert to compressed natural gas from diesel gas, the Supreme Court usurped the role of agencies, impeded their pollution control capacity, and created institutional and constitutional problems. *Id.* at 88, 91.

376. SANDS, *supra* note 57, at 95.

377. Roda Mushkat, *The Principle of Public Participation: An Asia-Pacific Perspective*, *in* INTERNATIONAL LAW AND SUSTAINABLE DEVELOPMENT: PRINCIPLES AND PRACTICES, *supra* note 270, at 607-11 (identifying stakeholders as both national and international non-state actors).

378. *Id.*

organizations of consultative groups, and to ensure the right of non-governmental organizations to protect the public interest through legal action.[379] In this regard, a number of NGOs in developing countries have undertaken to champion health and environmental rights.[380] In Uganda, in the case of the *Environmental Action Network Ltd. v. Attorney General & National Environmental Management Authority*, the plaintiffs, an environmental and health rights NGO, lodged a public interest application, on behalf of non-smoking members of the public under Article 50(2) of the Constitution, to protect their rights to a clean and healthy environment, their right to life, and for the general good of public health in Uganda.[381] The court concurred and later ordered the National Environmental Management Authority, the competent agency, to enact and implement smoke-free laws in public places.[382] NEMA indeed enacted the required law.[383] The challenge is that many NGOs dealing with environmental issues may not take up public health advocacy. While a number of NGOs are involved in the area of environment, many of the traditional health NGOs have not embraced broader environmental concerns in order to promote public health.

Furthermore, there are also low levels of networking and technical and scientific knowledge and exchanges among various local and national NGOs.[384] In this connection, invigorating health advocacy

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379. *Agenda 21*, *supra* note 63, ¶¶ 27.10 & 27.13.

380. *See* Mushkat, *supra* note 377, at 621 (noting that there is a contemporary trend toward enhancing NGOs' access to international remedies for violations of international environment laws).

381. Env't Action Network Ltd. v. Attorney Gen., Misc. Application No. 39 of 2001 (H.C.) (Uganda), *available at* http://www.greenwatch.or.ug/pdf/judgements/TEAN%20Versus%20A.G%20&%20NEMA.pdf.

382. *Id.*

383. NEMA enacted the National Environment (Prohibition of Smoking in Public Places) Regulations 2003.

384. *See* Ken Conca, *Greening the UN: Environmental Organizations and the UN System*, *in* NGOS, THE UN, AND GLOBAL GOVERNANCE 103, 116-18 (Thomas G. Weiss & Leon Gordenker eds., 1995) (noting that environmental organizations working toward consolidating and strengthening a coordinated movement face many obstacles, including but not limited to ideological differences between environmentalists that make coordinating global action difficult); *see also* Hasmy

within the domestic environmental agendas will require building capacities of NGOs to identify and implement opportunities for health protection in environmental law. Industries in developing countries have also helped to implement environmental and health norms through self-enforcement.[385] However, the disregard of environmental and health legislation by local industries in developing countries has been noted.[386] Due to the realization of the key role a NGO can play in enhancing domestic environmental governance and implementation of environmental law, the United Nations Environment Programme promotes the work of NGOs.[387] For example, UNEP's small size and relatively marginal status within the U.N. system has forced it to depend on the resources of NGOs to a greater extent than other U.N. agencies.[388] NGOs have played an integral role in UNEP's work, and UNEP serves as an informational clearing house for thousands of environmental NGOs.[389]

Agam, *Working with NGOs: A Developing World Perspective*, 13 COLO. J. INT'L ENVTL. L. & POL'Y 39 (2002).

385. *See, e.g.*, *Environmental Law and Self-Management by Industries in Kenya*, 17 J. ENVTL. L. 229, 242 (2005) (identifying some industries in Kenya, like subsidiaries of foreign companies, that are self-regulating and comply with pollution regulations and quality management systems set by their parent companies). Local industries in Kenya also exercise self-restraint and comply with pollution regulations but generally only due to public pressure, pressure from official authority, or local laws. *Id.*

386. *See, e.g.*, *id.* at 292-344 (discussing the plethora of legal, institutional, and other challenges to environmental and health enforcement by industries in Kenya, including substandard substantive laws and lack of legal enforcement).

387. *See* Conca, *supra* note 384, at 111 (stating that at the 1992 U.N. Conference on Environment and Development, an unprecedented number of NGOs attended the conference and exerted greater influence during the conference, including having representatives in the working parties of the PrepCom sessions).

388. *See id.* at 113 (suggesting that in the 1980s when momentum for environmental issues grew within the United Nations and UNEP could not land a significant role, strong NGO support may have enabled a stronger role for UNEP in environmental issues).

389. *See id.* (stating that UNEP's Nairobi-based network serves over 6,000 NGOs and helps ensure NGOs play an important part in the implementation of international environmental law). NGOs may influence world politics in two ways: first, by lobbying in the states, or second, influencing the values, behavior, and collective choice of large groups of people. *Id.* at 104.

V. REINVIGORATING PUBLIC HEALTH IN DOMESTIC ENVIRONMENTAL GOVERNANCE: THE ROLE OF SELECTED GLOBAL ACTORS

A. GENERAL

A discussion on strengthening national public health within domestic environmental governance and implementation of international environmental law inevitably requires the consideration of the laws, policies, and practices of other global actors whose policies greatly impact domestic health and environmental policies. Laws and practices of organizations such as the World Health Organization, the United Nations Environment Programme, the World Trade Organization, the International Standards Organizations, and the World Bank influence domestic environmental and health management in developing countries.[390] The health, environmental, and financial policies of these organizations are not all harmonious, but nonetheless they set international standards, many of which are codified as binding legal obligations in developing countries.[391] Efforts to streamline, coordinate, and where possible harmonize lawmaking and policy setting activities of these global actors, can contribute to better health and environmental governance in developing countries.

It is with this in view that international coordination between key global actors is essential and WHO, as the primary public health agency has the responsibility to monitor the plethora of global policies that can promote public health in the realm of international environmental law and policies. To illustrate this discussion, I

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390. *See* BIRNIE & BOYLE, *supra* note 56, at 79 (discussing the vital role of international organizations in supervising, monitoring, and initiating implementation of their codes and conventions, as well as providing a permanent forum in which members may negotiate). With the passage of time, the laws and policies of organizations like the WTO and World Bank have far-reaching impact on global and national actions for the protection of the environment. *See* Conca, *supra* note 384, at 109.

391. *See* BIRNIE & BOYLE, *supra* note 56, at 81 (remarking that a review of the U.N. and related institutional system conducted by UNCED has sought to streamline the present system to avoid the current duplication of effort and enhance coordination among various institutional processes).

consider the roles of two organizations, the World Health Organization and the World Trade Organization.

B. THE WORLD HEALTH ORGANIZATION

Attempts by States to strengthen health protection within their domestic environmental regimes cannot be pursued in isolation from global health governance, particularly the existing body of evidence based in international health law. When national environmental laws and policies with significant public health implications are enacted without considering the existing body of international health law, the proliferation of conflicting domestic health and environmental protection standards can undermine their effectiveness.[392] The effect of the conflicting standards is an incoherent body of health and environmental law and a waste of scarce financial and technical resources.[393] WHO is the international community's most prominent global public health agency.[394] The Charter of the U.N. enshrines the WHO with a mandate to promote and protect health within the U.N. system.[395] The Constitution of the WHO enumerates significant treaty-making powers, but to date these powers remain largely unused.[396] At the creation of the WHO in 1948, it was envisaged that international law would play an important role in global health policy.[397] The WHO

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392. *See generally* Bethany Lukitsch Hicks, Comment, *Treaty Congestion in International Environmental Law: The Need for Greater International Coordination*, 32 U. RICH. L. REV. 1643, 1644 (1999) (observing that the problem of "treaty congestion" creates situations in which treaty obligations are inconsistent, gaps exist in coverage, and goals and responsibilities are duplicated).

393. *See id.* (noting that procedural problems occur for developing countries with many treaty obligations that cannot, due to lack of time and trained human resources, effectively manage their duties arising under all their international obligations).

394. *See* BIRNIE & BOYLE, *supra* note 56, at 61 (stating that the WHO makes significant contributions to setting international standards, assists in drafting regulations, and provides consultants on relevant regulations).

395. U.N. Charter art. 57 (declaring that various specialized agencies established by intergovernmental agreement shall be brought into relationship with the U.N. in accordance with the provisions of Article 63).

396. WHO Const., *supra* note 83, art. 2, 62 Stat. at 2681-82, 14 U.N.T.S. at 187-89.

397. *See* Fidler, *supra* note 104, at 1086 (remarking that the WHO Constitution created the innovative international legal mecahnism of binding regulations).

Constitution provides the Organization with the authority to promote and adopt conventions, regulations, and recommendations that address any matter within its competence.[398]

Complementing the authority of the WHO, the World Health Assembly ("WHA") has the authority to adopt regulations on sanitation and quarantine issues, nomenclatures of diseases, causes of death, public health practices, and standards for international diagnostic procedures.[399] The WHA also has the authority to promulgate standards "for the safety, purity and potency of biological, pharmaceutical, and similar products moving in international commerce, and regulations governing the advertising and labeling of biological, pharmaceutical and similar products moving in international commerce."[400] The WHO has for long been a key actor with a major interest in the protection of the global environment.[401] In fact, WHO has adopted a number of resolutions in the area of environment and health.[402] WHO encourages compliance with its resolutions through its reporting procedure that requires its members to report annually to the organization on the "action taken and progress achieved in improving the health of its people."[403]

Moreover, WHO's definition of health, a state of complete physical, mental, and social well being, and not merely the absence of disease or infirmity,[404] gives the organization an expansive legal basis upon which to develop and promote international law. Furthermore, the WHO

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398. WHO Const., *supra* note 83, art. 2, 62 Stat. at 2681, 14 U.N.T.S. at 188.

399. *Id.* art. 21, 62 Stat. at 2685, 14 U.N.T.S. at 192.

400. *Id.* art. 21, 62 Stat. at 2685, 14 U.N.T.S. at 193.

401. *See* BIRNIE & BOYLE, *supra* note 56, at 61.

402. *See, e.g.*, Protection of the Marine Environment, WHA Res. 50.14, World Health Assembly, 50th Ass., 8th plen. mtg. (May 12, 1997) (urging States to implement the Global Program of Action for the Protection of the Marine Environment from Land-based Activities at national, regional, and international levels); Promotion of Chemical Safety, with Special Attention to Persistent Organic Pollutants, WHA Res. 50.13, World Health Assembly, 50th Ass., 8th plen. mtg. (May 12, 1997) (calling upon States to, inter alia, involve national health efforts to implement UNCED and WHO decisions relating to currently identified persistent organic pollutants).

403. WHO Const., *supra* note 83, arts. 61-65, 62 Stat. at 2691-92, 14 U.N.T.S. at 200.

404. *Id.* pmbl., 62 Stat. at 2680, 14 U.N.T.S. at 186.

Constitution empowers the organization to collaborate with other competent intergovernmental organizations, including UNEP.[405] In this connection, WHO and UNEP have promoted environmental protection in developing countries.[406] WHO has a strong scientific evidence base and infrastructures that can promote both environment and health protection in developing countries.[407] WHO has contributed to the development of the Stockholm Convention on Persistent Organic Pollutants that, inter alia, makes a provision for malaria control in developing countries.[408]

C. THE WORLD TRADE ORGANIZATION

While the objective of international trade law is primarily the promotion of trade, its impact on public health and environmental protection in developing countries should not be diminished. Under the WTO's legal regime, the protection of human health and the environment are exceptions that allow WTO parties to derogate from GATT provisions.[409] Yet, at times, WTO law has negatively

405. WHO Const., *supra* note 83, art. 70, 62 Stat. at 2693, 14 U.N.T.S. at 201 ("The Organization shall establish effective relations and cooperate closely with such other inter-governmental organizations as may be desirable. Any formal agreement entered into with such organizations shall be subject to approval by a two-thirds vote of the Health Assembly.").

406. For example, the WHO/FAO/UNEP joint Panel of Experts on Environmental Management for Vector Control and the WHO/ILO/UNEP International Programme on Chemical Safety are important joint projects.

407. *See* WHO Collaborating Centres General Information, http://www.who.int/kms/initiatives/whoccinformation/en (remarking that the WHO has a network of collaborating centers in all its six regions to conduct research and provide technical advice to developing countries in the area of health and the environment).

408. Stockholm Convention, *supra* note 107, Annex B pt. 2, 40 I.L.M. at 556 (providing an extensive role for the WHO in relation to the control of DDT). WHO statements during the negotiations were in favor of eventual elimination of DDT, but recognized that some countries, particularly developing countries, still needed DDT to control the malaria epidemic. *See, e.g.*, Report of the Conference of the Parties of the Stockholm Convention on Persistent Organic Pollutants on the Work of its First Meeting, Conference of the Parties, Annex 3, U.N. Doc. UNEP/POPS/COP.1/31 (2005).

409. *See* General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194, art. XX (stating that the GATT "shall be construed to prevent the adoption or enforcement by any contracting party of measures: . . . (b) necessary to

impacted on health and environmental protection in developing countries.[410] For example, unless access to HIV medicines can be effectively implemented under the Doha Declaration on TRIPS and Public Health, any resort to application of environmental legal regimes in the context of HIV/AIDS will be partially ineffective.[411] There are a number of health-related WTO agreements, and they describe conditions under which WTO members may subordinate trade considerations to other legitimate policy objectives such as the protection of public health and the environment.[412] This in turn provides insight into the degree to which trade liberalization regimes can respond to public health and environmental threats facing developing countries. For example, the largely unaccountable global activities of multinational corporations, transnational banks, and their financial affiliates has contributed to environmental and health threats.[413] Environmental regulations such as packaging laws or

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protect human, animal or plant life or health; . . . (g) relating to the conservation of exhaustible natural resources").

410. *See* Onzivu, *supra* note 86, at 243 (observing, for example, that tobacco, as neither a drug nor a lethal product, rests in a regulatory "no person's land," creating potential health hazards when exported to African countries).

411. WTO, Ministerial Declaration on the TRIPS Agreement and Public Health, WT/MIN(01)/DEC/2, 41 I.L.M. 746 (2002).

412. Relevant WTO agreements that address the protection of health include: General Agreement on Tariffs and Trade 1994, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 187, 33 I.L.M. 1153 (1994); Agreement on Agriculture, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, 1867 U.N.T.S. 410 (1994); Agreement on the Application of Sanitary and Phytosanitary Measures, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, Legal Instruments—Results of the Uruguay Round, 1867 U.N.T.S. 493 (1994); General Agreement on Trade in Services, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1B, 1869 U.N.T.S. 183, 33 I.L.M. 1167 (1994); Agreement on Technical Barriers to Trade, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1868 U.N.T.S. 120 (1994); Agreement on Import Licensing Procedures, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 33 I.L.M. 1168 (1994); Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299, 33 I.L.M. 1197 (1994).

413. *See, e.g.*, ESSENTIAL ACTION & GLOBAL EXCHANGE, OIL FOR NOTHING: MULTINATIONAL CORPORATIONS, ENVIRONMENTAL DESTRUCTION, DEATH AND IMPUNITY IN THE NIGER DELTA (2000), *available at* http://www.essentialaction.org/shell/Final_Report.pdf (describing the record of the environmental destruction

green taxes imposed by an importing country may be viewed in the realm of trade agreements as non-tariff barriers and prohibited with some defined exceptions.[414] This can undermine domestic health protection. The nexus between free trade and the environment was recognized in the important 1991 *Restrictions on Import of Tuna*[415] GATT dispute settlement panel ruling that found unlawful a U.S. trade ban aimed at preventing the incidental killing of marine mammals by commercial fishermen.[416]

Therefore, while the global trading system has helped to open up markets for goods and services around the world, it has also undermined global and national health policies,[417] by restricting

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and human rights violations in the oil-producing regions of Nigeria by multinational oil corporations such as Shell, Mobil, and Chevron).

414. *See, e.g.*, Richard J. King, *Regional Trade and the Environment: European Lessons for North America*, 14 UCLA J. ENVTL. L. & POL'Y 209, 213-15 (1996) (describing a European Court of Justice decision in which the Court ruled that Danish environmental restrictions on imported bottled drinks were non-discriminatory towards foreign products, but found that a container approval system failed the proportionality test because it was disproportionate to the objective pursued).

415. Report of the Panel, *United States—Restrictions on Imports of Tuna*, WT/DS21/R (Sept. 3, 1991).

416. *See* Marine Mammal Protection Act Amendments of 1994, Pub. L. No. 103-238, 108 Stat. 532(1994) (prohibiting the killing of marine mammals, and listing several exceptions); *see also* Report of the Panel, *supra* note 415, ¶ 7.1(a) (finding that the U.S. prohibition of Mexican yellowfin tuna and yellowfin tuna products was inconsistent with Article XI and was not justified by Article XX(b) or Article XX(g)). The Panel ruling energized environmentalists to become involved in trade policy to ensure that the progressive opening of markets did not infringe on the ability of States to establish and maintain their own national environmental protection laws. The establishment of the WTO's Committee on Trade and the Environment also reflects attempts to address the negative implications of the WTO trade regime on the environment. Marrakesh Ministerial Decision on Trade and Environment, MTN/TNC/45(MIN) (April 14, 1994) 33 I.L.M. 1267, 1268. The WTO Working Group on the Environment has met regularly since 1991. Its task is to examine, upon request, specific matters relevant to trade policy aspects of measures to control pollution and protect the human environment. *Id.*

417. *See* Ann Marie Kimball et al., *Trade Related Infections: Farther, Faster, Quieter*, GLOBALIZATION & HEALTH (2005), http://www.globalizationandhealth.com/content/1/1/3 (last visited Apr. 7, 2006) (remarking that the GATT agreements, which committed national economies to a reduction in import tariffs, created pressure to make more efficient production systems and may have permitted infectious agents to pass from animals to humans).

health or environmental protection activities and sometimes acting as the conduit for dissemination of harmful products and new infections to humans.[418]

VI. CONCLUSION

It is clear that since the 1972 United Nations Conference on the Human Environment in Stockholm, the Rio U.N. Conference on Environment and Development, and the U.N. Sustainable Development Conference in Johannesburg in 2002, health and environment has been increasingly recognized, and that the efforts to address both health and environment goals contribute to sustainable development. From the foregoing discussion, it is equally clear that international environmental law could be better utilized to promote national public health through the provision of technical and financial support, enhanced environmental impact assessment and the development of sound health provisions and structures in national environmental laws and institutions. In this connection, health ministries need to get more involved in participating in the environmental treaty development conferences and national implementation frameworks and other forums in the field of environment. This will enable them to champion actively the relevant public health issues in the resulting instruments and implementation structures. The health sector should be an integral part of the scientific, technical and legal input in the development and domestic implementation of international environmental law.

Mechanisms within international environmental law could be used for further research for a strong evidence base for health matters. However, the health ministries and health sector in developing countries should strengthen their internal capacities to participate in the development and implementation of international environmental law. One key requirement is the importance of undertaking legal reform of public health, including sectoral environmental health laws that are relevant to environmental protection. This coupled with effective interagency coordination, especially with national environmental institutions and ministries, can greatly strengthen

418. *See id.* (noting that international trade has become a catalyst for the emergence and dissemination of new inflections in human populations, including mad cow disease and HIV/AIDS).

environmental health in developing countries. Therefore, with the increasing public health threats resulting from environmental factors, it is essential that developing countries take a more robust approach in strengthening mechanisms in national environmental management that should counteract health threats. It is also important to involve both the environment and health sectors in international environmental law and policymaking that has a significant implication for the protection of public health.