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# ARTICLES

## GLOBAL WARMING AND CLIMATE CHANGE—AN OVERVIEW OF THE INTERNATIONAL LEGAL PROCESS

Durwood Zaelke\*  
and  
James Cameron\*\*

The Earth's atmosphere is being changed at an unprecedented rate, primarily by humanity's ever-expanding energy consumption, and these changes represent a major threat to global health and security. Sound policies must be quickly developed and implemented to provide for the protection of the planet's atmosphere . . . .

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. . . The first steps in developing international law and practices to address pollution of the air have already been taken: in the Trail Smelter arbitration of 1935 and 1938; Principle 21 of the 1972 Declaration of the UN Conference on the Environment; the Economic Commission for Europe (ECE) Convention on the Long Range Transboundary Air Pollution and its Protocol for sulphur reductions (Helsinki, 1985); Part XII of the Law of the Sea Convention; and the Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol (1987).

These are important first steps and should be actively implemented and respected by all nations. There is, however, no overall convention constituting a comprehensive international framework that can address the interrelated problems of

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the global atmosphere, or issues of climate change.<sup>1</sup>

## INTRODUCTION

Global warming, caused by the build-up in the atmosphere of carbon dioxide (CO<sub>2</sub>) and other "greenhouse gases," presents a grave risk to the international community,<sup>2</sup> and to both the life-sustaining environment of our planet and the essence of international law and institutions. Global warming is pervasive in its causes and devastating in its expected impacts, therefore demanding global cooperation and global solutions involving all of international society.<sup>3</sup> In contrast, traditional international law conceives of the international community more narrowly by focusing primarily on sovereign states while excluding corporations, nongovernmental organizations (NGOs), and individuals.<sup>4</sup> This problem is compounded by the difficulty of assessing and responding to global environmental risks, determining the degree of scientific certainty needed to assess the probability that global warming is in fact occurring,<sup>5</sup> and identifying and measuring the expected impacts of

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1. THE CHANGING ATMOSPHERE: IMPLICATIONS FOR GLOBAL SECURITY (July 5, 1988), held in Toronto, Canada on June 27-30, 1988, *reprinted in* SELECTED LEGAL MATERIALS, 5 AM. U.J. INT'L L. & POL'Y 515, paras. 16-17 (1990) [hereinafter TORONTO CONFERENCE STATEMENT].

2. *See id.* para. 1 (stating that the consequences of global warming "could be second only to a global nuclear war"); *see also* INTERNATIONAL CONFERENCE ON GLOBAL WARMING AND CLIMATE CHANGE: PERSPECTIVES FROM DEVELOPING COUNTRIES, held in New Delhi, India on Feb. 21-23, 1989 *reprinted in* SELECTED LEGAL MATERIALS 5 AM. U.J. INT'L L. & POL'Y 543, para. 1.1 (1990) [hereinafter TATA CONFERENCE STATEMENT] (stating that "[g]lobal warming is the greatest crisis ever faced collectively by humankind; unlike other earlier crisis, it is global in nature, threatens the very survival of civilization, and promises to throw up only losers over the entire international socio-economic fabric").

3. *See* P. ALLOTT, INTERNATIONAL LAW AND INTERNATIONAL REVOLUTION: RECONCEIVING THE WORLD 18 (1989) (defining the term "international society," as it is used throughout this article). Professor Allott refers to international society as [t]he society of the whole human race and the society of all societies. In other words, everything human that happens in the world is part of the social process of international society. We, the people, are members of international society—as are all the countless subordinate societies that we form, including, among others, the family, the industrial and commercial corporation, the State-societies, and non-governmental and intergovernmental organizations.

*Id.*

4. *See* I. BROWNLIE, PRINCIPLES OF PUBLIC INTERNATIONAL LAW 287 (3d ed. 1979) (presenting a traditional definition of the international community).

5. *See* J. Firor, Heating Up of the Climate (Feb. 4, 1989) (unpublished paper presented at the Doman Colloquium on International Law and Global Change, University of Colorado School of Law) (discussing the greenhouse effect). The paper states: [The] greenhouse effect is one of the better understood features of the atmosphere and climate. . . . [The various numerical models of the climate] all agree in showing that the continued increase in greenhouse gases in the atmosphere

global warming.<sup>6</sup> Another hurdle is the difficulty of defining and determining concepts of liability, responsibility, and illegality for ensuring adequate compensation for the measurable harmful impacts of global warming.

These uncertainties are forcing the international community to make difficult decisions regarding responses needed to counter the looming threat of global warming. The choice appears to be between adopting a precautionary approach today,<sup>7</sup> one that will be very expensive and that may itself alter society in fundamental ways, or waiting for the results of the current "experiment," and suffer the cataclysm that could result from making the wrong guess—a planet warming so rapidly that life may not be able to adapt.

The choice seems clear: international society does not have the luxury of waiting for scientific certainty before it responds to the potential threat of global warming. The international community must construct a global precautionary agreement to first, reduce emission of greenhouse gases to a safe level and second, to ensure that future development becomes sustainable.<sup>8</sup> This requires the participation and cooperation of all elements of international society working together to achieve such an agreement fast enough to avoid the most severe impacts of global warming, including sea-level rise. In the more developed

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will result in a rapid heating of the earth's surface . . . [and] this agreement . . . has led to a broad scientific consensus that the projections of a warmer climate should be taken seriously. . . . [There is, however,] some controversy over whether or not we have already observed the beginning of the greenhouse warming. The controversy is less than it might seem; it mostly has to do with the standards of proof. If you were to ask what the preponderance of the evidence shows, most experts would say yes the heating has begun. If you require the stiffer standard of beyond reasonable doubt, most would say let's wait a few years and see.

*Id.*

6. See Morgenstern & Tirpak, *Projecting the Impacts of Greenhouse Warming*, 15 EPA J. 8 (Jan.-Feb. 1987) (describing the EPA's use of global circulation models (GCMs) to help determine the impact of climate change).

7. See REALISING THE PRECAUTIONARY PRINCIPLE, GREENPEACE KEY PAPER 2 (July 1989) (explaining that the "Precautionary Principle" reverses the current regulatory approach used with most pollutants, which assumes that the biosphere can assimilate pollution until monitoring proves otherwise, and that the "Precautionary Principle" shifts the burden to the polluter to show the absence of harm); see also *TVA v. Hill*, 437 U.S. 153, 178 (1974) (noting that the Endangered Species Act institutionalizes caution with regard to the preservation of the nation's genetic heritage).

8. See WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, *OUR COMMON FUTURE* 43 (1987) (describing sustainable development as development that meets present needs without compromising the ability of future generations to meet their own needs). This conception of sustainable development contemplates the needs of the world's poor and the limitations technology and social organizations place on the environment's ability to meet present and future needs. *Id.*

states, for example, society will have to eliminate its wasteful lifestyles to reduce greenhouse gases and shift to sustainable development. In the less developed states,<sup>9</sup> society will have to avoid adopting wasteful lifestyles, and, with the assistance of the developed world, avoid using inefficient technologies in favor of promoting a sustainable society.<sup>10</sup>

The purpose of this article is to consider what mechanisms are available to developing states to better enable them to achieve a global precautionary agreement on global warming. This article focuses on low-

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9. The terms "developing states" and "less developed states" are used in this article interchangeably and refer to states still developing their economic/industrial sector. See *Report of the First Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, done at Helsinki, May 6, 1989*, U.N. Doc. UNEP/O2L.Pro.1/5 at 18-19 (1989) (listing the developing states to the Protocol). They include Afghanistan, Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Bhutan, Bolivia, Botswana, Brazil, Brunei Darussalam, Burkina Faso, Burma, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Costa Rica, Cote d'Ivoire, Cuba, Cyprus, Democratic Kampuchea, Grenada, Guatemala, Guinea, Guinea Bissau, Guyana, Haiti, Honduras, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kenya, Republic of Korea, Kuwait, Laos People's Democratic Republic, Lebanon, Lesotho, Liberia, Libyan Arab Jamahiriya, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Mexico, Mongolia, Morocco, Mozambique, Namibia, Nepal, Nicaragua, Niger, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Qatar, Romania, Rwanda, St. Christopher and Nevis, St. Lucia, St. Vincent and the Grenadines, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Singapore, Solomon Islands, Somalia, Sri Lanka, Sudan, Suriname, Swaziland, Syrian Arab Republic, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Uganda, United Arab Emirates, United Republic of Tanzania, Uruguay, Vanuatu, Venezuela, Viet Nam, Yemen, Yugoslavia, Zaire, Zambia and Zimbabwe. *Id.*

10. See TORONTO CONFERENCE STATEMENT, *supra* note 1, para. 13 (addressing the responsibility of developed states vis-a-vis developing states).

[T]he countries of the industrially developed world are the main source of greenhouse gases and therefore bear the main responsibility to the world community for ensuring that measures are implemented to address the issues posed by climate change. At the same time, they must see that the developing nations of the world, whose problems are greatly aggravated by population growth, are assisted and not inhibited in improving their economies and the living conditions of their citizens. This will necessitate a wide range of measures, including significant additional energy use in those countries and compensating reductions in industrialized countries. The transition to a sustainable future will require investments in energy efficiency and non-fossil energy sources. In order to ensure that these investments occur, the global community must not only halt the current net transfer of resources from developing countries, but actually reverse it. This reversal should embrace the relevant technologies involved, taking into account the implications for industry.

*Id.*; see also CLIMATE INSTITUTE, SUMMARY REPORT OF THE SYMPOSIUM ON THE IMPACT OF CLIMATE CHANGE FOR THE THIRD WORLD: IMPLICATIONS FOR ECONOMIC DEVELOPMENT AND FINANCING 23-24 (Mar. 24-25, 1988) (available at the Climate Institute, Washington, D.C.) (explaining that "the Third World can be expected to emulate the fossil fuel consumption patterns of the West to the peril of the entire planet").

lying island and coastal states which will be most affected by the sea-level rise caused by global warming. Part I describes global warming and its impacts, with an emphasis on sea-level rise. Part II suggests how low-lying states can use the international legal process to protect their unique interests. Both the judicial and the law-making process are discussed. Part III discusses participation by developing states in the international legal response to global warming. It also discusses the role of nongovernmental organizations (NGOs) in assisting states that address global warming and other environmental threats and argues for a broader role for NGOs in the international process. The article addresses whether an incremental approach using existing international law and institutions will be sufficient to meet the challenge of global warming or whether the problem is so different from any other, that a completely new approach, including new legal principles and institutions, will be necessary.

## I. GLOBAL WARMING AND SEA-LEVEL RISE

Among the developing states, the low-lying coastal and island states have special reason to be concerned about global warming and to use the international legal process to protect their interests. As a consequence of global warming, some will lose significant territory while others could literally disappear under the rising sea-level.<sup>11</sup>

### A. THE GREENHOUSE EFFECT

The term "greenhouse effect" refers to the ability of the atmosphere to absorb heat and warm the earth. The sun emits energy primarily as visible (short) wavelength radiation, which passes relatively easily through the atmosphere.<sup>12</sup> In contrast, the much cooler earth emits longer wavelength infrared radiation which is absorbed by greenhouse gases in the atmosphere.<sup>13</sup> This "trapped" energy warms the atmosphere and reradiates heat back to earth, in a manner roughly analogous to the process for warming a botanical greenhouse.

Some greenhouse gases, including water vapor and carbon dioxide (CO<sub>2</sub>), occur naturally in the atmosphere; the absence of such gases

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11. MALÉ DECLARATION ON GLOBAL WARMING AND SEA LEVEL RISE, held in Malé, Maldives on Nov. 14-18, 1989 [hereinafter MALÉ DECLARATION], reprinted in SELECTED LEGAL MATERIALS, 5 AM. U.J. INT'L L. & POL'Y 602 (1990).

12. See MacDonald, *Scientific Basis for the Greenhouse Effect*, in THE CHALLENGE OF GLOBAL WARMING 123, 126 (D. Abrahamson ed. 1989) (explaining that radiation is emitted from the sun primarily in the region from 0.4 to 1.0 microns).

13. *Id.* at 126. Radiation from the earth is mainly in the range from 6 to 22 microns. *Id.* at 127, fig. 9.1.

would make the earth about 35 degrees centigrade colder and, thereby, incapable of supporting life.<sup>14</sup> Since the beginning of the industrial age, however, the burning of fossil fuel and other human activities have substantially increased the concentrations of CO<sub>2</sub> and other naturally occurring greenhouse gases.<sup>15</sup> Man has also released artificial, extremely potent, and long-lived greenhouse gases, such as chlorofluorocarbons (CFCs) and other halocarbons, into the atmosphere.<sup>16</sup>

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14. *Id.* at 124.

15. Cicerone, *Global Warming, Acid Rain, and Ozone Depletion*, in *THE CHALLENGE OF GLOBAL WARMING* 231, 232, fig. 15.1 (D. Abrahamson ed. 1989) (giving the pre-industrial and 1986 atmospheric concentrations of CO<sub>2</sub>, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and tropospheric ozone (O<sub>3</sub>)); U.S. ENVIRONMENTAL PROTECTION AGENCY, *POLICY OPTIONS FOR STABILIZING GLOBAL CLIMATE CHANGE*, EXECUTIVE SUMMARY 12, 15-16 (Feb. 1989) (draft report to Congress) [hereinafter *POLICY OPTIONS*] (describing the primary sources and rates of greenhouse gas emissions).

The concentration of CO<sub>2</sub> in the atmosphere has increased by approximately 25%, from a pre-industrial level of 275 ppm to a level of 346 ppm in 1986. Cicerone, *supra* at 232, fig. 15.1. The present rate of increase is approximately 0.4% per year. *Id.* Fossil-fuel combustion is the primary source of CO<sub>2</sub> and accounts for the emission of approximately 5.5 billion tons of carbon, while deforestation, in particularly tropical rainforest destruction, accounts for the emission of 0.4 to 2.6 billion tons of carbon. *POLICY OPTIONS, supra*, at 15. CO<sub>2</sub> accounts for 49% of the contribution to global warming from greenhouse gases. *Id.* at 12, fig. 3.

Methane, the second most important greenhouse gas, contributes 18% to greenhouse warming. *Id.* The atmospheric concentration of methane has increased by 120% from a preindustrial level of .75 ppm to a level of 1.65 ppm in 1986. Cicerone, *supra*, at 232, fig. 15.1. The sources of methane are not known with certainty. Increased rice cultivation and animal husbandry, landfills, and coal seams probably cause this increase in methane emission. *POLICY OPTIONS, supra*, at 15.

Nitrous oxide has increased from pre-industrial levels of 280 ppm to 305 ppm in 1986. Cicerone, *supra*, at 232, fig. 15.1. Nitrous oxide contributes 6% to greenhouse induced warming. *POLICY OPTIONS, supra*, at 12, fig. 3. The sources of nitrous oxide are also uncertain. They are thought to include nitrogenous fertilizer, land clearing, biomass burning, and fossil fuel combustion. *Id.* at 15.

The remaining "natural" greenhouse gases, for example CO, NO<sub>x</sub>, and tropospheric ozone account altogether for 13% of the greenhouse gas contribution to global warming. *Id.* at 12, fig. 3.

16. See *POLICY OPTIONS, supra* note 15, at 16 (stating that CFCs were introduced into the atmosphere for the first time in the twentieth century). Although CFCs are present in the atmosphere in much smaller concentrations than CO<sub>2</sub>, molecule for molecule, a CFC may be 20,000 times more potent a greenhouse gas than CO<sub>2</sub>. *Id.* Unlike CO<sub>2</sub>, CFCs have no natural sinks, so once released into the atmosphere they remain until they break down, a period of 50 to 200 years. Ciburowski, *Sources, Sinks, Trends, and Opportunities*, in *THE CHALLENGE OF GLOBAL WARMING* 213, 220 (D. Abrahamson ed. 1989). CFCs account for 18% of the total contribution of greenhouse gases to global warming. *Id.* at 12, fig. 3; Montreal Protocol on Substances That Deplete the Ozone Layer, *adopted and opened for signature* Sept. 16, 1987 (*entered into force* Jan. 1, 1989), *reprinted in* 26 I.L.M. 1541 (1987) [hereinafter *Montreal Protocol*]. CFCs have recently become subject to international regulation because of their potential for depleting stratospheric ozone, a problem closely related to climate change. *Id.* Production of CFCs is scheduled by international agreement to be reduced by as much as 50% by 1999. *Id.*; Vienna Convention for the Protection of the Ozone Layer, *adopted and opened for signature* Mar. 22, 1985 (*entered into force* Sept. 22, 1988),

By the year 2030, at present rates, the increase in greenhouse gases will be approximately equivalent to a doubling of the amount of CO<sub>2</sub> in the atmosphere prior to the industrial revolution.<sup>17</sup> The effects of such a substantial increase in greenhouse gases will be dramatic, and perhaps catastrophic. Global mean temperatures are expected to increase between 1.5 to 4.5 degrees centigrade within the next 40 years.<sup>18</sup> This rapid and unprecedented increase in global temperatures is expected to have a number of severe impacts, including inter-regional shifts in agriculture and diminished agricultural productivity, reduced availability of freshwater, and forest dieback resulting in reduced fuelwood supplies. In addition, global warming is expected to cause sea levels to rise, thereby increasing coastal flooding, erosion of shorelines, inundation of wetlands and lowlands, salinization of estuaries and aquifers, and infrastructural damage from storm surges.<sup>19</sup>

Climate predictions are made on the basis of complex, three-dimensional computer models, representing the atmosphere and surface of the earth.<sup>20</sup> Despite the use of the most powerful supercomputers, however, these global circulation models (GCMs) are limited in their ability to represent and predict global climate.<sup>21</sup> Complex climate-related systems, such as ocean currents, clouds, and many climate "feedback" processes can presently be represented only crudely, if at all.<sup>22</sup> As a

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reprinted in 26 I.L.M. 1529 (1987) [hereinafter Vienna Convention]; Oceans and Environment Program, Office of Technology Assessment, *An Analysis of the Montreal Protocol on Substances That Deplete the Ozone Layer*, in THE CHALLENGE OF GLOBAL WARMING 291, 293-94 (D. Abrahamson ed. 1989) (suggesting that the Montreal Protocol is unlikely to meet the 1999 target, and may in fact permit CFC production to increase).

17. International Assessment of the Role of Carbon Dioxide and Other Greenhouse Gases in Climate Variations and Associated Impacts, held in Villach, Austria on Oct. 9-15, 1985, reprinted in *The Scientific Consensus*, in THE CHALLENGE OF GLOBAL WARMING 63, 64 (D. Abrahamson ed. 1989).

18. *Id.* at 65. These numbers take on added meaning when one considers that at the height of the last ice age, some 18,000 years ago, the earth was only 3 to 5 degrees Centigrade than it is today. S. SCHNEIDER, GLOBAL WARMING 28 (1989).

19. See *infra* notes 24-48 and accompanying text (discussing the causes and effects of sea-level rise).

20. Firor, *Greenhouse Effects and Impacts on Physical Systems*, in THE CHALLENGE OF GLOBAL WARMING 113, 114 (D. Abrahamson ed. 1989); see U.S. ENVIRONMENTAL PROTECTION AGENCY, THE POTENTIAL EFFECTS OF CLIMATE CHANGE ON THE UNITED STATES 22 (Dec. 1989) (report to Congress) [hereinafter POTENTIAL EFFECTS]. Climate modeling research utilizing global circulation models is currently being carried out at the National Center for Atmospheric Research (NCAR), Oregon State University (OSU), NOAA's Geophysical Fluid Dynamics Laboratory (GFDL), NASA's Goddard Institute for Space Studies (GISS), and the United Kingdom Meteorological Office (UKMO). *Id.* at 24.

21. POTENTIAL EFFECTS, *supra* note 20, at 22.

22. *Id.*; Lashof, *The Dynamic Greenhouse: Feedback Processes That Can Influence Global Warming*, in COPING WITH CLIMATE CHANGE 102, 102 (Topping ed. 1989).



consequence, GCMs are able to predict climate change only within rather broad ranges.<sup>23</sup>

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23. Uncertainties about these climate related systems have caused some researchers to question the reliability of GCMs and the inferences which may be drawn from them. Some feedback processes, for example, are known to enhance the greenhouse effect, others are known to retard it, while for still others, it cannot be said with certainty whether they will increase or decrease the greenhouse effect.

The many potential feedback processes associated with global warming, taken together, could significantly alter the rate and extent of climate change. Lashof, *supra* note 22, at 102. Feedback processes, however, are not very well understood and, consequently, most have not been included in climate models. *Id.* One example of a positive feedback process is the decrease in albedo (reflectivity) caused by melting snow and ice cover. This contributes to warming as the earth absorbs more energy from the sun. *Id.* at 103. Forest dieback caused by global warming would trigger another positive feedback process, as decomposing biota on the ground and in the soil releases CO<sub>2</sub> and methane, increasing the atmospheric concentration of greenhouse gases, and contributing to warming. *Id.* at 105.

Not all feedback mechanisms are positive. For example, increased amounts of CO<sub>2</sub> in the atmosphere could stimulate plant growth, thereby removing carbon from the atmosphere and storing it safely in plants. *Id.* The ability of forests to store large amounts of carbon suggests that afforestation and reforestation can play important roles in solving the problem of global warming. It is estimated in one study that a net annual addition of 3.5 billion hectares of new forest could sequester the entire annual emission of CO<sub>2</sub>. Sedjo & Solomon, *Climate and Forests*, in GREENHOUSE WARMING: ABATEMENT AND ADAPTATION 105, 109 (Rosenberg, Easterling, Crosson, & Darmstadter eds. 1989).

Warmer atmospheric temperatures are likely to give rise to increased cloud formation. Lashof, *supra* note 22, at 102. Generally, an increase in low cloud cover will produce a negative feedback, while an increase in high cirrus clouds will produce a positive feedback. *Id.* However, GCMs cannot determine which type of clouds are likely to form, and hence, whether cloud formation will enhance or diminish the greenhouse effect. *Id.* at 103.

Another source of climate uncertainty is the system of oceans. Oceans are huge thermal reservoirs. Because oceans warm less rapidly than the atmosphere, there is a time-lag during which ocean and atmospheric temperatures are not in equilibrium. MacDonald, *supra* note 12, at 124. Thus, temperature records do not accurately reflect the global commitment to warming. Even if atmospheric levels of greenhouse gases were stabilized, the global temperature would rise perhaps an additional 0.5-0.7 degrees Centigrade. Abrahamson, *Global Warming: The Issue, Impacts, Responses*, in THE CHALLENGE OF GLOBAL WARMING 3, 10 (D. Abrahamson ed. 1989).

Oceans also store tremendous amounts of carbon, equivalent to more than 80% of the earth's total carbon reserves. Woodwell, *Biotic Causes and Effects of the Disruption of the Global Carbon Cycle*, in THE CHALLENGE OF GLOBAL WARMING 71, 75 (D. Abrahamson ed. 1989). Recent studies indicate, however, that researchers may have overestimated the ability of oceans to absorb anthropogenically emitted CO<sub>2</sub> from the atmosphere. *Oceans*, 3 World Climate Change Rep. (BNA) 13 (Dec. 1989). Oceans may take up only 30% of anthropogenically produced CO<sub>2</sub> rather than 50% as previously estimated. *Id.* If this finding is correct, it means that greenhouse events could occur about 20% sooner than previously expected. *Id.*

Although the precise interaction between climate and oceans is not well understood, the impact of oceans on climate is evident when one considers, for example, that Europe, which is at the latitude of Siberia and Hudson Bay, has a much milder climate due to the effects of the Gulf Stream. S. SCHNEIDER, *supra* note 18, at 47. It is clear that ocean currents play an important and complex role in determining the earth's climate. According to one theory, the earth can "flip" from interglacial to glacial states

## B. SEA-LEVEL RISE

Global warming from the greenhouse effect will cause sea level to rise, as gradually warming oceans undergo thermal expansion, and small mountain glaciers melt.<sup>24</sup> Sea-level will rise 25 to 40 centimeters by 2050,<sup>25</sup> and perhaps as much as 2 meters by 2100,<sup>26</sup> according to current estimates.

The impacts of rising sea level include: (1) inundation of wetlands and lowlands;<sup>27</sup> (2) erosion of shorelines;<sup>28</sup> (3) increased coastal flood-

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if the deep, salty currents which circumnavigate the globe are disrupted. Such a disruption could occur if changes in climate alter the precipitation patterns carrying freshwater from the Atlantic to the Pacific, changing the distribution of salt which helps drive these currents. Broecker, *What Drives Glacial Cycles?*, Sci. Am., Jan. 1990, at 49.

24. See POTENTIAL EFFECTS, *supra* note 20, at 123-25; INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE: ADAPTIVE OPTIONS AND POLICY IMPLICATIONS OF SEA LEVEL RISE AND OTHER COASTAL IMPLICATIONS OF CLIMATE CHANGE 2, held in Washington, D.C. on Nov. 27-Dec. 1 1989) [hereinafter WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP].

The level of the sea is primarily determined by climate. During the last major ice age (18,000 years ago) a substantial amount of the water in today's oceans was locked in glaciers, and the surface of the sea was 100 meters below its present level. POTENTIAL EFFECTS, *supra* note 20, at 124. Conversely, during the last interglacial period (100,000 years ago), when the mean temperature was about one degree centigrade warmer than today, the surface of the sea was approximately seven meters above its present level. *Id.*

Numerous studies have examined the possibility of a significant contribution to sea-level rise from melting and eventual disintegration of the West Antarctic Ice Sheet. See Titus, *The Causes and Effects of Sea Level Rise*, in THE CHALLENGE OF GLOBAL WARMING 161, 164 (D. Abrahamson ed. 1989). Most experts, however, do not regard this as likely to happen within the next century. *Id.* Nevertheless, the possibility cannot be entirely dismissed. In such a case estimates of global sea-level rise range as high as 6 m. Hekstra, *Sea-Level Rise: Regional Consequences and Responses*, in GREENHOUSE WARMING: ABATEMENT AND ADAPTATION 53, 55 (Rosenberg, Easterling, Crosson, & Darmstadter eds. 1989). While melting of the Greenland Ice Sheet is expected to contribute 0.37 mm per year to sea-level rise, the increase will probably be offset by a 0.3 mm per year decrease due to ice accumulation in Antarctica. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra*, at 2.

25. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 2.

26. POTENTIAL EFFECTS, *supra* note 20, at 123.

27. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 2; Titus, An Overview of the Effects of Sea Level Rise, (unpublished paper prepared for the U.S. Environmental Protection Agency 1989) [hereinafter Titus, An Overview].

The land area that would be subject to inundation or deterioration from saltwater intrusion within one to three centuries is on the order of five million square kilometers—only about 3% of total land area, but one-third of the world's cropland. Hekstra, *supra* note 24, at 60. Much of this area is densely populated and contains many large cities. *Id.*

Wetlands have historically responded to sea-level rise by migrating landward. Po-

ing;<sup>29</sup> (4) salinization of estuaries and aquifers;<sup>30</sup> (5) altered tidal ranges in rivers and bays;<sup>31</sup> (6) delta subsidence due to changes in sediment deposition;<sup>32</sup> (7) increased height and frequency of waves;<sup>33</sup> and (8) decreased light reaching the ocean floor.<sup>34</sup>

POTENTIAL EFFECTS, *supra* note 20, at 125. But the rapid rise of sea levels forced by global warming threatens to overtake the ability of wetlands to migrate. Leatherman, Impacts of Sea Level Rise on the Coasts of South America 75 (Univ. of Md. 1989) (unpublished). Manmade structures such as roads, buildings and bulkheads will impede the movement of wetlands. Titus, *supra* note 24, at 171. Wetland migration will be further impeded by dikes and levees which may be necessary to protect valuable coastal areas from sea-level rise. *Id.* at 173-74. The USEPA estimates that if only densely developed areas of the United States coast are protected, a 50 centimeter sea-level rise would cause the loss of 20-45% of coastal wetlands. POTENTIAL EFFECTS, *supra* note 20, at 140, table 7-4. A 200 centimeter rise would result in the loss of 33-80%. *Id.* If all shores are protected, up to 90% of coastal wetlands could be lost. *Id.*

28. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 2; Titus, An Overview, *supra* note 27. Erosion of shorelines results in the loss of substantially more land than that which is directly inundated by sea-level rise. Titus, An Overview, *supra* note 27. A one-meter rise would generally cause sandy beaches to erode 50-200 meters. *Id.* Atoll islands, subject to constant erosion from slowly rising seas, maintain themselves with fresh sand produced by coral reefs, which are themselves threatened by sea-level rise. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 3. Beaches and beach resorts are particularly threatened by erosion due to sea-level rise. Titus, *supra* note 24, at 178. Most resort beaches are not more than 30 meters wide at high tide and would be subject to erosion from a rise of 30-40 centimeter. *Id.*

29. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 2; Titus, An Overview, *supra* note 27. Sea-level rise could increase the risk of flooding in a number of ways, including: (1) raising the "base" of storm surges; (2) removing protective barriers such as sand dunes, beaches, mangrove swamps, and marshes; and (3) decreasing drainage after storms. *Id.*

30. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 2; Titus, An Overview, *supra* note 27. Sea-level rise increases the salinity of estuaries by widening and deepening them, thereby increasing the amount of sea water which mixes with freshwater and resisting freshwater inflow. *Id.* Saltwater penetration can reduce aquifers, particularly in very low-lying areas where the land above sea level is so shallow that the freshwater lens is "squeezed" out. *Id.*

31. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 2; Titus, An Overview, *supra* note 27. Sea-level rise could change tidal ranges by removing barriers to tidal currents and changing the resonance frequencies of tidal basins. *Id.*

32. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 2; Titus, An Overview, *supra* note 27. Sea-level rise would shift the area of sediment deposition upstream, thereby changing the location and configuration of deltas. *Id.*

33. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 2; Titus, An Overview, *supra* note 27. In shallow areas, the depth of the water limits the size of waves. As sea-level rise deepens these areas, the size of waves will increase. *Id.*

34. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 2; Titus, An Overview, *supra* note 27. As sea level rises, less light will reach the bottom, reducing the productivity of virtually all submerged vegetation to some degree. *Id.*

Developed areas will be particularly affected by sea-level rise. While shorelines constitute only a small fraction of the land area of most nations, a disproportionately large amount of development is located near coasts.<sup>35</sup> These threatened areas contain many major cities and up to one-fifth of the world's population.<sup>36</sup> A one-meter rise in sea-level would destroy a large portion of Bangladesh.<sup>37</sup> A two-meter rise would inundate its capital, Dhaka, as well as Shanghai and Lagos—the largest cities of China and Nigeria—and 20% of the populated area and farmland of Egypt.<sup>38</sup>

Of all geographic areas, low-lying reef and atoll islands, such as those found in the South Pacific and Indian Oceans, may be the most threatened by sea-level rise.<sup>39</sup> These islands are rarely more than three meters above sea level and some are considerably less.<sup>40</sup> Within only a few decades the islands of Kiribati could disappear beneath the Pacific, making refugees of the islands' 60,000 inhabitants.<sup>41</sup> The Republic of Maldives, in the Indian Ocean, is also vulnerable; a two-meter rise in sea level would flood the capital and over one-half the populated atoll islands of the republic.<sup>42</sup> The Pacific atoll island nations of Tokelau,

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35. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 1-2 (describing the commercial, recreational, and environmental values of coastal areas); *see also* Titus, An Overview, *supra* note 27 (describing the attraction of coastal areas for purposes of development and human habitation).

36. Hekstra, *supra* note 24, at 60. Sir Crispin Tickell, Permanent Representative to the UN for the UK, estimates that within 50 or 60 years, as many as 300 million people could be made environmental refugees by sea-level rise. Tickell, *Environmental Refugees: The Human Impact of Global Climate Change*, Natural Environment Research Council Annual Lecture given at the Royal Society, London, June 5, 1989.

37. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 3. A one-meter, sea-level rise will flood 12% of habitable deltaic Bangladesh in an area where 9% of the population resides. *Summary Report of the Symposium on the Impact of Climate Change for the Third World: Implications for Economic Development and Financing* 9-10 (Mar. 24-25, 1988), held in Washington, D.C. (summarizing speech of Dr. James Broadus, Dir. Marine Policy Center, Woods Hole Oceanographic Institute) [hereinafter Broadus Speech]. The resulting economic loss is estimated at \$ 1 billion, representing 8% of GDP. *Id.* Other authors estimate significantly greater land loss due to a one meter sea-level rise.

38. WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 3.

39. *See* MALÉ DECLARATION, *supra* note 11 (describing the special predicament of small, coastal and island states); *see also* TATA CONFERENCE STATEMENT, *supra* note 2 (asserting that many of the most serious effects of global climate change will occur in the developing countries).

40. Roy & Connell, *The Greenhouse Effect: Where Have All the Islands Gone?*, PAC. ISLANDS MONTHLY, Apr.- May, 1989, at 16-17.

41. *Id.* at 17. Kiribati has 20 populated atolls and a land area of 700 square kilometers, more than half on the island of Kiritimati. *Id.* President Ieremia Tabai of Kiribati remarked that "[i]f the greenhouse effect raises sea levels by one meter it will virtually do away with Kiribati." *Id.*

42. Titus, An Overview, *supra* note 27; The Maldives consist of a double chain of

Tuvalu, and the Marshall Islands are similarly threatened.<sup>43</sup>

Even a moderate rise in sea level could have serious consequences for small coastal and island states. Despite their small size, many have relatively large populations.<sup>44</sup> Existing problems caused by rapid population growth and development would be exacerbated as floods, and possibly tropical storms, become more frequent and severe.<sup>45</sup> Erosion, already a problem, due in part to the diversion of currents by man-made structures, would be accelerated.<sup>46</sup> Saltwater would displace freshwater, diminishing already strained supplies of drinking water and damaging crops which cannot tolerate salt.<sup>47</sup> Tourism and fishing, economic staples for small coastal and island states, will also suffer as beaches erode and dying coral reefs cease to yield their plentiful supply of bait.<sup>48</sup>

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26 atolls. Wells & Edwards, *Gone With the Waves*, NEW SCI., Nov. 11, 1989, at 48. Most of its islands lie between 1 and 1.5 meters above mean sea level and its highest point is 3.5 m. *Id.* Most of the population live between 0.8 and two meters above mean sea level. *Id.*; Letter dated 20 November 1989 from the Permanent Representative of Maldives to the United Nations addressed to the Secretary-General, U.N. Doc. A/C.2/44/8 (Nov. 24, 1989). In his inaugural address, His Excellency Maumoon Abdul Gayoom, President of the Republic of Maldives stated:

[n]or would any of our fisherman ever think that the sea which is the bountiful source of his livelihood could, in a matter of decades, become his eternal grave. But that, Ladies and Gentlemen, is precisely the prospect that we have to face today. . . . As we are all aware, there is a growing scientific consensus that within the next century, sea levels will rise at a faster rate than at any time in history. . . . [W]e in the Maldives are convinced that a universal campaign against the causes of climate change and global warming should be undertaken at once. But the Maldives is not going to be the only victim. Many other countries represented here will have to bear the brunt of the ocean's onslaught a few decades from now. And the stark truth is that no realistic solutions . . . have yet been identified.

*Id.* at 1-4.

43. Roy & Connell, *supra* note 40.

44. *Id.* at 20 (declaring that the Marshall Islands has one of the fastest-growing populations in the world, with Kiribati and Tuvalu not far behind); Wells & Edwards, *supra* note 42, at 48 (declaring that in the Maldives the population of more than 200,000 is growing at the rate of 3.1% per year).

45. Wells & Edwards, *supra* note 42, at 48 (discussing the impact of increasing storm intensity on the Maldives and Pacific coral nations).

46. *Id.*; WORKSHOP REPORT TO THE COASTAL ZONE MANAGEMENT SUBGROUP, *supra* note 24, at 3 (discussing the increased erosion of atoll islands which would result from a reduction in coral productivity due to sea-level rise); Roy & Connell, *supra* note 40, at 20 (discussing the effects of erosion on atoll islands and the difficulty of protecting islands against erosion).

47. Roy & Connell, *supra* note 40, at 20. In the Republic of Maldives, the freshwater supplies of the capital, Malé are dwindling. Consumption greatly exceeds recharge into the aquifer, so that freshwater is presently available only in the center of the island. Titus, An Overview, *supra* note 27.

48. Wells & Edwards, *supra* note 42, at 50-51.

## II. USING THE INTERNATIONAL LEGAL PROCESS TO PROTECT LOW-LYING DEVELOPING STATES

To protect their territory and population from sea-level rise and to ensure their full and equitable participation in the global warming debate, low-lying developing states have at least two separate, but related, opportunities to use the international legal process. The first is to use the judicial process by way of a contentious action in the ICJ, an action submitted by special agreement, or through a request for an advisory opinion.<sup>49</sup> The goal would be an opinion from the Court on the governing principles in international law affecting the states responsible for, and victims of, sea-level rise and other consequences of global warming.

The second option is to draft an international convention on global warming as an alternative model to use in the negotiations with the international community. In particular, such a convention would focus on the special concerns of low-lying states and help elaborate the legal regime which is expected to be declared in 1992 at the twenty-year review of the 1972 Stockholm Conference on the Global Environment.<sup>50</sup>

### A. THE INTERNATIONAL COURT OF JUSTICE

As discussed above, the less industrialized low-lying coastal states, especially islands such as Kiribati in the South Pacific and the Maldives in the Indian Ocean and river deltas such as Bangladesh, are expected to be among the first and most severely affected by global warming.<sup>51</sup> Sea-level rise, combined with the increased intensity and

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49. U.N. CHARTER art. 96. The International Court of Justice will hear a case and issue an advisory opinion on the request of an applicant party. *Id.* However, the applicant must be (1) a body or organization authorized by the UN to make such requests, and (2) the matter on which an advisory opinion is requested must be a "legal question arising out of the scope of their activities." *Id.* The bodies expressly authorized to make such requests include the General Assembly, Security Council, or any authorized organ of the UN or specialized agency. *Id.* The General assembly has authorized the following bodies in accordance with art. 96(2) of the Charter: the Economic and Social Council, the Trusteeship Council, the interim Committee of the General Assembly, the Committee on Applications for Review of Administrative Tribunal Judgments, the International Atomic Energy Agency, and all the specialized agencies except the Universal Postal Union. *Id.* The UN General Assembly retains the power to authorize bodies to request an advisory opinion; it may do so continually and is not restricted to any particular number of bodies. *Id.*

50. See *United Nations Conference on Environment and Development*, G.A. Res. 228, 44 U.N. GAOR Supp. (No. 49) at 300, U.N. Doc. A/44/49 (1989), reprinted in *SELECTED LEGAL MATERIALS*, 5 AM. U.J. INT'L L. & POL'Y 621 (1990). The conference will be hosted by the Government of Brazil. *Id.* subpara. 2.

51. See *supra* notes 25-48 and accompanying text (discussing sea-level rise and

frequency of storms, could cause the loss of lives, property, livelihood, and, in some cases, the entire territory of a state, creating stateless environmental refugees.

As discussed next, these states, particularly the relatively blameless victim states which do not produce any appreciable greenhouse gases, may be able to use the ICJ to obtain international legal remedies. The notions of liability, responsibility, illegality, and duty to compensate may support certain legal actions by a low-lying state or group of such states against one or more industrialized states, or justify an application to the ICJ for an advisory opinion.<sup>52</sup> Developing the applicable international legal principles through litigation will also assist states to develop their own policy positions for participation in the convention process.<sup>53</sup>

### 1. Existing Legal Principles

The substantive legal principles a state would rely upon in the ICJ are the same regardless of the procedural route chosen. A state would need to characterize the creation of circumstances leading to the identification of global warming and sea-level rise as an international legal wrong justifying a remedy.

Under general principles of international law it may be possible to demonstrate that there exists an obligation not to allow the territory of one state to be used to generate conditions leading the catastrophic consequences of global warming and sea-level rise. It may not be necessary to show that the developed states had knowledge that their activities were damaging and contributed to the phenomenon of global warming. It must be shown that, rather, as a matter of fact, developed states are completely responsible for the use of substances or industrial operations which contribute to global warming and cause damage.<sup>54</sup>

Traditionally, proving the existence of a rule of customary international law upon which to base a claim for damage to the environment

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associated impacts of global warming); see also Sancton, *What on Earth Are We Doing?*, TIME, Jan. 2, 1989, at 27 (referring to the flooding in Bangladesh).

52. But see Sand, *Institutions for Global Change: Whither Environmental Governance?*, 5th Tallories Seminar on International Environmental Issues, (May 14-18, 1989) (discussing the general opposition to the use of the ICJ).

53. Litigation also may help augment the political power of the otherwise less powerful developing states and provide them greater opportunity to protect their unique interests. OPPENHEIM, INTERNATIONAL LAW-A TREATISE 19, 20 (1905).

54. See *The "Act of State" According to International Law* [1973] 2 Y.B. INT'L L. COMM'N 161, 188, U.N. Doc. A/9010/Rev. 1 (1973) (discussing requirements for holding states internationally responsible for acts or omissions).

has been troublesome.<sup>55</sup> The nature and scope of the rules are not particularly clear. Customary international law does not, for example, settle the question of the attribution to the state damage caused by private activities within its territory.<sup>56</sup> Moreover, the present system of state liability is inadequate, in many respects, for dealing with the consequences of transboundary pollution and other environmentally damaging activities having international consequences.

International law assumes that all states have the sovereign right to develop their economy and to prescribe rules to govern activities which take place on sovereign territory.<sup>57</sup> In the *Corfu Channel Case* (UK v. Albania),<sup>58</sup> however, the ICJ endorsed the principle that sovereignty itself embodies "the obligation of every state not to allow its territory to be used for acts contrary to the rights of other states." Similarly, in the *Lac Lanoux Arbitration* (Spain v. France),<sup>59</sup> the Tribunal held that a state has an obligation not to use its rights to the extent of ignoring the rights of others.

In the only known international action involving air pollution, the *Trail Smelter Case* (United States v. Canada),<sup>60</sup> the United States

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55. See I. BROWNIE, *supra* note 4, at 4-15 (discussing the establishment of customary rules of international law).

56. See *The "Act of State" According to International Law*, *supra* note 54, at 189 (explaining the rules of liability of states for acts of its nationals).

57. *Charter of Economic Rights and Duties of States*, 31 U.N. GAOR Supp. (A/9631) at 50, U.N. Doc. A/RES/3281 (1974), reprinted in 14 I.L.M. 251 (Jan. 15, 1975) (providing in Chapter 2, Article 1 that "every state has the sovereign and inalienable right to choose its economic system as well as its political, social and cultural systems in accordance with the will of its people, without outside interference, coercion or threat in any form whatsoever").

58. *Corfu Channel* (U.K. v. Alb.), 1949 I.C.J. 4, 22. As four British warships passed within Albanian territorial waters on their way through the North Corfu Channel, two of them were badly damaged after striking mines. Three weeks later the British swept the channel and cleared it of some twenty mines. *Id.* at 12-13. The International Court of Justice held that "states in time of peace have a right to send their warships through straits used for navigation between two parts of the high seas without the previous authorization of a coastal state provided that the passage is *innocent*." *Id.* at 28 (emphasis in original). Although the minesweeping operation was not "innocent" and violated Albania's sovereignty, the earlier passages by the British ships were legal. *Id.* at 29-30. Due to Albania's knowledge of the presence of the mines, the Court held Albania responsible for the deadly consequences of their presence. *Id.* at 37-39.

59. *Lake Lanoux* (Fr. v. Spain), 53 AM. J. INT'L L. 156 (1959). In order to generate hydroelectric power France proposed to divert water from the Carol River which ran from France into Spain. *Id.* Spain objected by stating that such a project violated treaties between the two countries and customary law. *Id.* The tribunal seemed to accept the principle that an upstream state acts unlawfully if it changes the condition of a river to the serious injury of a down stream state, however, the tribunal ultimately held that France's efforts to make full restitution to the river were sufficient not to contravene any rule of international law. *Id.* at 170.

60. *Trail Smelter* (U.S. v. Can.), 3 R. Int'l Arb. Awards 1907 (1941).



brought a claim against Canada for damage to property in the state of Washington caused by sulfuric and other noxious fumes drifting over the frontier from a smelter in British Columbia. The Tribunal declared that:

[U]nder the principles of international law . . . no state has the right to use or permit the use of territory in such a manner as to cause injury by fumes in or to the territory of another, of the properties of persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.<sup>61</sup>

The principles of *Trail Smelter Case* are accepted as a rule of customary international law by a large number of states. In the *Nuclear Tests Case* (Australia v. France), Australia asked the ICJ to declare that the carrying out of further atmospheric nuclear tests was inconsistent with the applicable rules of international law and would be unlawful "in so far as it involves modification of the physical conditions of and over Australian territory [and] pollution of the atmosphere and of the resources of the seas."<sup>62</sup> The *Trail Smelter* principles were cited with approval and may well have determined the outcome of the case had the French Government not made a unilateral declaration of intent to stop testing.<sup>63</sup> As a result of this declaration, the Court stopped short of issuing a decision on the merits of the action.

In 1972, the U.N. Conference on the Human Environment, held in Stockholm, led to a Declaration of Principles (the Stockholm Declaration) to preserve and enhance the human environment.<sup>64</sup> This Declaration broadly reflects the *Trail Smelter* principles. Principle 21, for example, provides that:

[S]tates have . . . the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.<sup>65</sup>

Although the Stockholm Declaration is not legally binding, it has received considerable support from states and has guided state practice. For example, Principle 21 was expressly recommended by a U.N. Gen-

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61. *Id.* at 1965.

62. *Nuclear Tests* (Aus. v. Fr.), 1974 I.C.J. 253.

63. *Id.* at 389 (Judge de Castro, dissenting).

64. *Stockholm Declaration on the Human Environment*, in *Report of the United Nations Conference on the Human Environment*, U.N. Doc. A/CONF. 48/14 and Corr. 1 (1972), U.N. Sales No. E. 73. II. A.14 and Corr., reprinted in 11 I.L.M. 1416 (1972). Delegates from 113 States attended the Conference and adopted a Declaration of Principles for the Preservation and Enhancement of the Human Environment and an Action Plan consisting of 109 Recommendations for environmental action at the international level. *Id.*

65. *Id.* at 1420.

eral Assembly Resolution<sup>66</sup> as laying down the basic rules governing the international responsibility of states in regard to the environment. The principle is echoed in U.N. General Assembly Resolution 3281,<sup>67</sup> in Article 30 of the Charter of Economic Rights and Duties of States,<sup>68</sup> and in Article 194(2) of the 1982 U.N. Convention on the Law of the Sea, which provides:

[S]tates shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other states and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with this Convention.<sup>69</sup>

It may be possible to establish that the *Trail Smelter* case and Principle 21 together have become customary international law through state practice and the requisite *opinion juris* (the belief by a state that its acts and practice are required as a matter of law).<sup>70</sup> If such a rule can be proved to have emerged, then any breach of that rule would lead to the obligation or liability to make reparation. This is an undisputed rule of international law. It is reflected in, for example, the *Chorzow Factory Case*,<sup>71</sup> and is now codified in Article 1 of the International Law Commission's Draft Articles on State Responsibility.<sup>72</sup>

In addition to the foundation provided by traditional international legal principles for a global warming action, further support may be found in recent developments in international environmental law. In particular, new legal theories are emerging which bond traditional and modern elements. All courts like to be persuaded that there is a continuous thread of principle which justifies or explains changes in the law when in fact change may be in the form of an evolutionary leap. It is in this area that low-lying states could be most hopeful of advocating the movement forward of the law so that it adequately addresses and set-

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66. *International Responsibility of States in Regard to the Environment*, G.A. Res. 2996, 30 U.N. GAOR Supp. at 42-43, U.N. Doc. A/8901 (1972).

67. *Charter of Economic Rights and Duties of States*, *supra* note 57.

68. *Id.*

69. United Nations Convention on the Law of the Sea, *opened for signature* Dec. 10, 1982, U.N. Doc. A/CONF.62/122 (1982), *reprinted in* 21 I.L.M. 1261, 1308 (1982) [hereinafter *Convention on Law of the Sea*].

70. See P. Sands, *Transboundary Nuclear Air Pollution-The Legal Materials*, in CHERNOBYL: LAW AND COMMUNICATION 1, 11 n.49 (P. Sands ed. 1988) (stating that "[m]ost writers have accepted this formulation [in the *Trail Smelter* case] as a rule of customary international law"); *id.* at 15 (stating that "the *Trail Smelter* case . . . [and] Principle 21 . . . together suggest that a universally accepted rule has emerged, and is applicable to transboundary nuclear pollution").

71. *Chorzow Factory* (Ger. v. Pol.), 1928 P.C.I.J. (ser. A) No. 17, at 47.

72. *The "Act of State" According to International Law*, *supra* note 54, at 173.

ties the issues arising from global warming and sea-level rise.

## 2. *Recent Developments in International Environmental Law*

While no treaty presently addresses directly the global warming threat, substantive legal principles do exist in dozens of treaties between many states. These principles may be relied upon as expressions of custom in order to flesh out the body of customary rules and should also be considered in any new convention addressing the response to the present climate threat. Because the greenhouse effect is of a global nature, treaties on marine pollution,<sup>73</sup> the Convention on Long Range Transboundary Air Pollution,<sup>74</sup> the Antarctic Treaty,<sup>75</sup> conventions on protecting the ozone layer,<sup>76</sup> and treaties on outer space<sup>77</sup> are useful guides, because they regulate the global commons—areas which have no international borders.

These treaties reveal legal principles which could be applied to the consequences of the greenhouse threat: the recognition of the transboundary nature of pollution;<sup>78</sup> the right of states to preserve their natural resources;<sup>79</sup> the obligation of states to protect the environment and

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73. Convention on Law of the Sea, *supra* note 69; Convention for the Prevention of Marine Pollution from Land-Based Sources, *done at Paris*, Feb. 21, 1974, ST/LEG/SER.B/18 (1974), *reprinted in* 13 I.L.M. 352 (1974) [hereinafter Convention on Marine Pollution].

74. Convention on Long-Range Transboundary Air Pollution, Nov. 13, 1979, T.I.A.S. No. 10, 541 [hereinafter Convention on Transboundary Air Pollution]. The convention was adopted within the framework of the Economic Commission for Europe on the Protection of the Environment. *Id.* at 3. It established the means by which the contracting parties shall exchange information, consultation, research and monitoring in order to develop policies and strategies to combat long-range transmissions of air pollutants. *Id.* at 4, art. 3.

75. Antarctic Treaty, Dec. 1, 1959, 12 U.S.T. 794, T.I.A.S. No. 4780. The signatories agreed *inter alia*, to promote international cooperation in scientific investigation, to prevent militarization, and to prohibit any nuclear explosions or disposal of radioactive waste in Antarctica. *Id.* at 795-96.

76. Vienna Convention, *supra* note 16; Montreal Protocol, *supra* note 16.

77. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, *opened for signature* Jan. 25, 1967, 610 U.N.T.S. 205. The treaty recognizes the common interest of all mankind in the "exploration and use of outer space for the benefit of all peoples irrespective of the degree of their economic or social development." *Id.* at 207. Article IX provides that parties to the treaty shall conduct their activities in outer space "so as to avoid their harmful contamination and also adverse changes in the environment of the Earth." *Id.* at 209-10, art. IX.

78. See Montreal Protocol, *supra* note 16, at 1530 (recognizing that world-wide discharges of certain substances can significantly deplete the stratospheric ozone layer); see also Convention on Law of the Sea, *supra* note 69 (recognizing that countries shall take all measures necessary to guarantee that their activities do not cause damage by pollution to other countries and their environments); Convention on Transboundary Air Pollution, *supra* note 74, at 4 (defining long-range transboundary air pollution).

79. See Convention on Law of the Sea, *supra* note 69, at 1308 (stating that coun-

the corresponding state liability for pollution;<sup>80</sup> cooperation in the scientific, technical, and legislative fields;<sup>81</sup> the requirement to use measures of a predetermined standard to combat pollution;<sup>82</sup> the recognition that imminent damage is as significant as actual damage;<sup>83</sup> the requirement to study alternate measures for attaining environmental objectives;<sup>84</sup> the recognition of the importance of assistance to developing states;<sup>85</sup> the requirement of environmental impact assessments;<sup>86</sup> and the importance of monitoring, enforcement, and education.<sup>87</sup> A number of the emerging principles find further expression in the World Commission Experts Group Report, namely:<sup>88</sup>

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tries have a sovereign right to exploit their natural resources).

80. *See id.* at 1308, 1315-16 (recognizing the obligation of countries to protect and to preserve the marine environment); *see also* Convention on Marine Pollution, *supra* note 73, at 360 (emphasizing each country's responsibility to prevent, minimize, and eliminate pollution from land-based sources).

81. *See* Vienna Convention, *supra* note 16, at 1530 (directing cooperation in legal, scientific, and technical fields); *see also* Convention on Law of the Sea, *supra* note 69, at 1309 (mandating cooperation in studies, research programs, and exchange of information and data); Convention on Transboundary Air Pollution, *supra* note 74, at 4 (stating that countries shall initiate and cooperate in research and development).

82. *See* Vienna Convention, *supra* note 16 (obligating countries to cooperate in the formulation of agreed measures, standards, and procedures); *see also* Convention on Law of the Sea, *supra* note 69, at 1309 (providing that countries shall cooperate in establishing appropriate scientific criteria); Convention on Transboundary Air Pollution, *supra* note 74, at 6 (stressing the need to use comparable or uniform procedures for monitoring the long-range transmission of air pollutants).

83. Convention on Law of the Sea, *supra* note 69, at 1309, art. 198.

84. *See id.* at 1309-20 (requiring countries to take other necessary measures to prevent, reduce, and control pollution); *see also* Convention on Marine Pollution, *supra* note 73, at 359 (mandating that countries establish joint programs of scientific and technical research to determine the best methods of reducing marine pollution from land-based sources).

85. *See* Montreal Protocol, *supra* note 16, at 1555-56 (entitling developing countries to delay compliance with control methods for ozone depletion); *see also* Vienna Convention, *supra* note 16, at 1531 (ensuring that developing nations receive information on alternative technologies and equipment, necessary equipment and facilities for research, and training of scientific personnel); Convention on Law of the Sea, *supra* note 69, at 1309 (granting preferential treatment for developing countries in the allocation of funds, technical assistance, and specialized services).

86. *See* Convention on the Law of the Sea, *supra* note 69, at 1309 (requiring an assessment of the potential effects when countries believe that their planned activities may cause substantial pollution or harmful changes to the marine environment).

87. *See id.* (providing that countries shall monitor the risks or effects of pollution); *see also* Convention on Transboundary Air Pollution, *supra* note 74, at 6-7 (discussing the monitoring and evaluation of long-range transmission of air pollutants).

88. WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT 215 (1987). The World Commission on Environment and Development is an independent body, established in 1983, that is linked to, but outside the control of, governments and the UN system. The Commission's mandate includes three objectives: to reexamine the critical environment and development issues and to formulate realistic proposals for dealing with them; to propose new forms of international cooperation on these issues that will influence policies and

- that every human being has a fundamental right to a healthy environment;
- that states shall conserve the environment for the benefit of present and future generations;
- that states shall maintain ecosystems and ecological processes essential for the functioning of the biosphere;
- that states shall use transboundary and global natural resources in a reasonable and equitable manner;
- that states shall prevent or abate any transboundary pollution which causes or could cause significant harm;
- that states may carry out or permit certain dangerous but beneficial activities provided they take all reasonable precautionary measures to limit the risk and ensure that compensation is provided should substantial transboundary harm occur, and provided that states shall ensure that compensation is provided for substantial transboundary harm resulting from activities which were not known to be harmful at the time they were undertaken;
- that states shall cooperate in good faith with other states to achieve optimal use of transboundary and global natural resources and effective prevention or abatement of transboundary environmental interferences;
- that states shall provide prior notification and assessment of planned activities which may have significant transboundary effect; and
- that states shall cease activities which breach an international obligation regarding the environment and provide compensation for harm caused.<sup>89</sup>

The principle of a right to an adequate environment expressed in the World Commission Experts Group Report is also found in The Declaration of the Hague.<sup>90</sup> The Hague Declaration begins by recognizing that "the right to live is the right from which all other rights stem. Guaranteeing this right is the paramount duty of those in charge of all states throughout the world."<sup>91</sup> The right to life is not a new invention. As a well established international legal right, states have a duty to recognize that any activity which threatens that right would be an international legal wrong.<sup>92</sup>

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events in the direction of needed changes; and to raise the levels of understanding and commitment to action of individuals, voluntary organizations, businesses, institutes and governments. *Id.* at 1.

89. *Id.* at 25-27.

90. DECLARATION OF THE HAGUE, Mar. 11, 1989, *reprinted in* SELECTED LEGAL MATERIALS, 5 AM. U.J. INT'L L. & POL'Y. 567 (1990) [hereinafter DECLARATION OF THE HAGUE]. The Hague Declaration was clearly designed to be a grand statement of political intent couched in the language of law, as the following demonstrates:

[b]ecause of the nature of the dangers involved, remedies to be sought involve not only the fundamental duty to preserve the ecosystem, but also the right to live in dignity in a viable global environment, and the consequent duty of the community of nations vis-a-vis present and future generations to do all that can be done to preserve the quality of the atmosphere.

*Id.*

91. *Id.*

92. The right to a healthy environment has emerged as one of the solidarity or third generation human rights. Sohn, *The New International Law: Protection of Rights*

As discussed above, the legal principles which could be applied as evidence of emerging customary international law in the field of the environment in general and to global warming in particular include: the 1972 Stockholm Declaration, the 1985 Vienna Convention for the Protection of the Ozone Layer, the 1987 Montreal Protocol, and the U.N. General Assembly Resolution 43/53 on the Protection of the Global Climate in 1988. In addition, there is further documentary evidence of customary law being developed as part of the current effort to assess global warming and develop an appropriate international legal response which will assist in identifying the content, nature, and scope of any customary international rule.<sup>93</sup> Whether or not these impressive sources will be accepted as a customary rule of international law is not clear; that decision will ultimately be made by the ICJ.

### 3. *Procedural Routes in the ICJ*

There are three basic procedural routes open to states wishing to use the international legal process to establish liability in the manner discussed above, for bringing litigation in the ICJ: a contentious case, where both parties have submitted to the jurisdiction of the ICJ; a case submitted to the court by special agreement of the parties (a compromise); and a request for an advisory opinion from the ICJ.<sup>94</sup>

An example of a contentious case is one brought by Nicaragua against the United States.<sup>95</sup> In this type of case, the defendant can withdraw from the jurisdiction of the ICJ on the grounds that the issue is essentially political and, therefore, not suitable for judicial resolution.

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of Individuals Rather Than States, 32 AM. U.L. REV. 1, 59-61 (1982); Alston, *A Third Generation of Solidarity Rights: Progressive Development or Obfuscation of International Human Rights Law?*, 29 NETH. INT'L L. REV. 307 (1982); Marks, *Emerging Human Rights: A New Generation for the 1980's?*, 33 RUTGERS L. REV. 435, 441-45 (1981); Gormley, *The Right to a Safe and Decent Environment*, 28 INDIAN J. INT'L L. 1 (1988).

93. See *infra* notes 99-167 and accompanying text (discussing the preparatory work being done for a framework convention on global warming). Of particular relevance are the recent U.N. Resolutions on climate change and sea-level rise, and the recent declarations issued at the Hague, Langkawi, Malé and Noordwijk.

94. See U.N. CHARTER art. 96 (discussing the circumstances under which the ICJ will hear a case).

95. *Concerning Military and Paramilitary Activities In and Against Nicaragua* (Nicar. v. U.S.), 1986 I.C.J. 14 (June 27, 1986). The Nicaraguan government brought suit against the United States for violating international law by supporting Contra rebels who mined Nicaraguan harbors and who were seeking to overthrow the Sandinista government. *Id.* The United States, after the Court decided it had jurisdiction to hear the claim, withdrew from further proceedings. *Id.* In terminating its acceptance of the compulsory jurisdiction of the Court, the United States acknowledged that it would accept the jurisdiction of the Court in mutually submitted disputes. *Id.*

Contentious cases are fraught with difficulty. The jurisdictional rules of the ICJ favor reluctant defendant states, the evidentiary burden on a plaintiff state is great both in terms of law and fact, and the cost of such actions is considerable. The likelihood is that unless they were to receive the assistance of *pro bono* counsel, the states which will be the most immediate victims of sea-level rise and the associated impacts of global warming could not afford to bring an action against a developed state which had allegedly caused the problem unless they could be near certain of success. Scientific knowledge on global warming, while advanced and quickly developing, might struggle to meet the legal standards of causation to find liability in any one state.

Attempting to fashion a global warming case that could be submitted to the ICJ by special agreement may be a less difficult option. This requires that the parties agree to submit an existing dispute to the court, thereby accepting its jurisdiction for that particular case. It is also possible for a state to institute an action in the ICJ even though the opposing party has not recognized the jurisdiction of the Court, and then invite the defendant to submit to jurisdiction. Although no such case has ever succeeded in bringing an unwilling defendant before the ICJ, it allows the aggrieved party the opportunity to file the case resulting in the attendant political benefits, which are well known to environmental litigators in the United States. Often, simply filing a case can shame a defendant into action. Furthermore, international law operates continually in the political arena and can be used to encourage the political settlement of disputes, much as litigation in domestic courts can be used to focus the attention of legislators on the problem involved in the litigation.

Finally, advisory opinions may be requested by twenty-two different organs and agencies of the United Nations.<sup>96</sup> Although the United Nations Environment Programme (UNEP) is not yet included within this group, advisory opinions can be requested by the Trusteeship Council, the World Meteorological Organization (WMO), the World Health Organization, the Food and Agriculture Organization, the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the International Maritime Organization, among others. In the current international political arena it is not entirely fanciful to imagine one of these organizations—perhaps even the General Assembly itself—having sufficient interest to ask for an opinion from the ICJ.<sup>97</sup>

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96. See U.N. CHARTER, *supra* note 49 (explaining which U.N. bodies may request advisory opinions).

97. Evidence of this interest can be found at the March 1989 conference that pro-

As there is little precedent for a claim of the nature and scope suggested here, an advisory opinion or a case submitted by special agreement would be preferable to a contentious action. Furthermore, the costs of an advisory opinion or a case submitted by special agreement are substantially lower than those of a contentious action because the organization or state which brings the action does not necessarily have to prove a causal connection between the activities of one state and damage suffered by another. The costs of investigating, bringing, and examining evidence would, therefore, be considerably reduced.

The goal of an advisory opinion or a case submitted by special agreement would be a declaration of law aimed at creating a structure for a new regime of global environmental protection. The new regime should make preventative action a priority, but should also provide for liability and compensation for the consequences of global warming. The Court might even be persuaded to support a declaration of law with a ruling that the activities revealed by the evidence as causing global warming should be ceased, limited, controlled, or compensated. The Court might even address how the cost of any urgent remedial actions should be allocated among particular states or international organizations funded by states.

In sum, at the initiative of the low-lying developing states, an advisory opinion could be sought by one of the eligible U.N. organs to establish the customary international legal principles applicable to global warming and sea-level rise, or the low-lying developing states could fashion a case to be submitted by special agreement. While it is not certain that customary international law has evolved sufficiently to address the problem adequately, an opinion from the ICJ clarifying the limits of current law would contribute to the foundation of international law and provide persuasive evidence of the rules and principles binding the whole of international society. Such an opinion would have the power to guide and direct the behavior of states in the future, and would prove useful in the negotiation of a global framework convention.

#### B. PARTICIPATING IN THE CONVENTION PROCESS

In addition to pursuing an action in the ICJ, low-lying developing states have another opportunity for using the international legal process to ensure that appropriate consideration is given to their special vulnerability to sea-level rise and other impacts of global warming. They can participate in the up-coming convention process on global warming,

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duced the Hague Declaration. *Supra* note 90.



and prepare their own draft of the convention to reflect their unique concerns. To do this, the low-lying developing states will find it useful to understand the current preparatory efforts already underway. They will then need to marshal the relevant scientific and legal expertise, and design their own negotiating strategy. Developing states might be assisted in this process by both the more developed states, and NGOs.

### 1. *Preparatory Work for a Framework Convention*

#### a. *U.N. Intergovernmental Panel on Climate Change: Vienna Convention Model*

The principal preparatory work for the drafting of a global climate change convention is being undertaken under the auspices of the United Nations. The Vienna Convention and the Montreal Protocol<sup>98</sup> are being looked to as relevant models. In December 1988, the General Assembly unanimously passed a special resolution initiated by Malta and supported by nineteen other states, calling for the adoption of a framework convention on climate change.<sup>99</sup> The resolution called upon UNEP, the WMO, and the Intergovernmental Panel on Climate Change (IPCC)<sup>100</sup> immediately to initiate action leading, possibly within the next eighteen months, to a comprehensive review and recommendations with respect to: (a) the state of knowledge of the science of climate and climatic change, special emphasis on global warming; (b) programmes and studies of the social and economic impact of climate change particularly global warming; (c) possible policy responses by Governments and others to delay, limit or mitigate the impact of adverse climate change; (d) relevant treaties and other legal instruments dealing with climate; (e) elements for possible inclusion in a future international convention on climate.

The target date for completing the IPCC's initial assessment is September 1990, prior to the Second World Climate Conference to be held in Geneva, Switzerland, in November 1990. The goal is to complete a framework convention on climate change no later than the twenty-year Stockholm review conference to be held in San Paolo, Brazil in June

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98. Vienna Convention, *supra* note 16; Montreal Protocol, *supra* note 16.

99. U.N. Resolution on the Protection of the Global Climate, G.A. Res. 43/53, A/RES/43/53 (Jan. 27, 1989), reprinted in SELECTED LEGAL MATERIALS 5 AM. U.J. INT'L L. & POL'Y 525 (1990) [hereinafter U.N. Resolution 43/53] (stating that the General Assembly "[r]ecognizes that climate change is a common human concern because climate is an essential condition that sustains life on earth") (emphasis original).

100. The IPCC was established in November 1988 by UNEP and WMO "to carry out internationally co-ordinated scientific assessments of the magnitude, timing and potential impact of climate change." *Id.* para. 8.

1992.<sup>101</sup>

The IPCC has established three main working groups to carry out its mandate: Working Group I, chaired by the United Kingdom, is responsible for assessing available scientific information on climate change; Working Group II, chaired by the Soviet Union, is responsible for assessing the environmental and socio-economic impacts of climate change; and Working Group III, chaired by the United States, is responsible for formulating response strategies.<sup>102</sup>

The drafting of the list of elements for a framework convention on climate change is being done by Working Group III, the Response Strategies Working Group. The United Kingdom, Canada, and Malta oversee legal matters within this group and have particular responsibility for coordinating and directing the drafting. An initial draft of possible elements for a framework convention was produced for the plenary meeting of the IPCC in October 1989.<sup>103</sup>

At the October 1989 meeting of the Working Group III, there was "[full] support for a framework convention" on climate change "based on [the] format of [the] Vienna Convention for the Protection of the Ozone Layer," which has both a framework convention setting forth general principles and a series of specific protocols including the Montreal Protocol.<sup>104</sup> Working Group III also acknowledged its "[f]ull sup-

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101. See, e.g., NOORDWIJK DECLARATION FOR THE MINISTERIAL CONFERENCE ON ATMOSPHERIC POLLUTION AND CLIMATE CHANGE, held in Noordwijk, The Netherlands on Nov. 7, 1989, reprinted in SELECTED LEGAL MATERIALS 5 AM. U.J. INT'L L. & POL'Y 592 (1990), para. (29) 5 [hereinafter NOORDWIJK DECLARATION] (stating that the Conference "[u]rges all involved . . . to do their utmost . . . to ensure adoption of the convention as early as 1991 if possible and no later than at the Conference of the United Nations on Environment and Development in 1992") (emphasis in original); *Id.* para. (29) 1 (stating that the Conference

"[u]rges all countries to join and intensify the ongoing work within UNEP and WMO through the IPCC with respect to the compilation of elements for a framework convention on climate change so that negotiations upon it can start as soon as possible after the adoption of the interim report of the IPCC") (emphasis in original).

102. U.N. Resolution 43/53, *supra* note 99, para. 21.

103. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, REPORT OF THE SECOND SESSION OF IPCC WORKING GROUP III/RESPONSE STRATEGIES WORKING GROUP I, sec. 2, held in Geneva, Switzerland on Oct. 2-6, 1989 [hereinafter RESPONSE STRATEGIES] IPCC LIST OF ELEMENTS, reprinted in Appendix A. (listing the possible elements for inclusion in a framework convention on climate change).

104. See WMO/UNEP/IPCC Working Group III (RSWG) Second Session, Geneva, 2-6 Oct. 1989, *Legal Measures and Processes: Synopsis of Contributions (submitted by Chairman Working Group III, Dr. F. M. Bernthal)* at 2-5 [hereinafter *Legal Measures Synopsis*]. At the October meeting in Geneva, the Response Strategies Working Group supported a dual track approach, whereby specific protocols with specific reduction goals and timetables would be pursued at the same time as a framework convention. *Id.*

port" to establish within a framework convention "general principles and obligations with respect to climate change" and "institutional framework and mechanisms to monitor and assess climate change, and manage the responses"; and to "take into account the needs, technological and financial, of developing countries."<sup>105</sup>

The draft of possible elements includes an explicit statement that "[s]ome of the proposed elements are controversial, some were in fact objected to, but all have been included to stimulate discussion at the national and international levels."<sup>106</sup> For example, while Working Group III contributors agreed on the need to establish "a secretariat and Conference of the Parties on the lines of the Vienna Convention," a number of countries also suggested "an Executive Committee of the Conference, and establishment of some new authority to monitor implementation."<sup>107</sup> One country objected to "a new institution," and there was a predictable "lack of consensus" on the powers to be given to "whatever body is responsible [for] implementation."<sup>108</sup> There also was "no clear consensus" about "the particular financial provisions" needed to assist developing countries, although there was "widespread acceptance of the importance of recognizing the particular needs of developing countries."<sup>109</sup> Similarly, there were "differing views" on the timing for specific protocols on CO<sub>2</sub> and other greenhouse gases; some states wanted protocols to follow the convention, and others wanted specific undertakings in the framework convention, specifically on CO<sub>2</sub> emissions.<sup>110</sup>

The IPCC's effort has been endorsed by the United Kingdom;<sup>111</sup> the

105. *Id.* at 1-2, para. A(2).

106. *See* RESPONSE STRATEGIES, *supra* note 103, sec. 3.

107. *Legal Measures Synopsis*, *supra* note 104, at 4-5, para. B (4)(d)(i).

108. *Id.*

109. *Id.* at 5, para. B4(d)(iii) (emphasis omitted).

110. *Id.* at 5-6, para. B4(e)(ii).

111. *See* Address by Sir Crispin Tickell, Statement of the Permanent Representative to the U.N. from the United Kingdom to ECOSOC (May 8, 1989). Sir Tickell commented that:

First we believe that we should seek to establish as soon as possible a simple framework or umbrella convention, which would set out general principles and guidelines. In doing so we could follow the precedent set by the Vienna Convention of 1985 on the ozone layer. The drafting of principles and guidelines for good climate behavior . . . is a task clearly falling to the Inter-governmental Panel on Climate Change. . . .

Secondly we should fit specific Protocols into the framework as scientific evidence requires and permits. . . . In this fashion we could establish arrangements sufficiently flexible to make early progress on problems which might otherwise prove intractable.

*Id.*; *see also* Text of a Speech Made by the Prime Minister The Rt. Hon. Margaret Thatcher FRS MP on the Global Environment to the United Nations General Assem-

Council of the European Community in its resolution of June 21, 1989;<sup>112</sup> the Heads of State or government of the "Group of 7" major industrial nations, and the President of the Commission of the European Communities at the Paris Summit of the Arch, held on July 16, 1989;<sup>113</sup> the Heads of Government of the Commonwealth meeting held in Langkawi, Malaysia, on October 21, 1989;<sup>114</sup> the 68 States which attended the Ministerial Conference on Atmospheric Pollution and Climate Change held at Noordwijk, the Netherlands, on November 6, 1989;<sup>115</sup> the small coastal and island states meeting held in Male, Republic of Maldives, on November 14-18, 1989;<sup>116</sup> the participants at the Tokyo Conference on the Global Environment and Human Response Toward Sustainable Development, on September 11-13, 1989,<sup>117</sup>

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bly 6,8 (Nov. 8, 1989). [hereinafter Thatcher UN Speech].

112. Council Resolution, O.J. EUR. COMM. (No. C. 183) 4 (June 21, 1989). The Resolution:

INVITES the Commission and the Member States [of the EEC] to take urgent action to increase energy savings; to improve energy efficiency; to promote the development and use of energy sources, such as nonfossil fuels, which will not contribute to the greenhouse effect; and to give high priority to the development and introduction in the Member States of the innovative commercially viable technologies in these fields. In this context due account must be taken of safety aspects, security of supply, environmental impact, public health and economic consideration.

*Id.* The June 21, 1989 Council Resolution indicates support for many legal principles important for a climate change convention, and invites the Commission to propose measures to address the greenhouse gas emissions in a report by the end of 1990. *Id.* The principles include the use of energy alternatives and efficiency; the need to consider environmental impact; aid to developing countries to reconcile constraints stemming from climate change with their developmental goals; the importance of research to understand climate change; co-ordination of activities worldwide; and education and citizen involvement. *Id.*

113. ECONOMIC DECLARATION, SUMMIT OF THE ARCH, para. 40 (July 16, 1989), reprinted in SELECTED LEGAL MATERIALS, 5 AM. U.J. INT'L L. & POL'Y 571 (1990) (stating that "[w]e strongly support the work undertaken by the Intergovernmental Panel on Climate Change").

114. THE LANGKAWI DECLARATION ON ENVIRONMENT, held in Langkawi, Malaysia on Oct. 21, 1989, reprinted in SELECTED LEGAL MATERIALS, 5 AM. U.J. INT'L L. & POL'Y 589, para. 8 (1990) [hereinafter LANGKAWI DECLARATION] (committing the Heads of Government of the Commonwealth to "support the work of the UNEP/WMO Intergovernmental Panel on Climate Change. . . [and] applaud[ing] the efforts of member governments to advance the negotiation of a framework convention under UN auspices").

115. NOORDWIJK DECLARATION, *supra* note 101, para. 4 (stating that "it is now time for governments of all countries to commit themselves to the IPCC").

116. MALÉ DECLARATION, *supra* note 11, at 603 (stating that the IPCC "is recognized as the main forum for the on-going work on science, impacts and response strategies of climate change").

117. TOKYO CONFERENCE STATEMENT ON THE GLOBAL ENVIRONMENT AND HUMAN RESPONSE TOWARD SUSTAINABLE GROWTH, held in Tokyo, Japan on Sept. 11-13, 1989, reprinted in SELECTED LEGAL MATERIALS, 5 AM. U.J. INT'L L. & POL'Y 577, III.(a) (1990) [hereinafter TOKYO CONFERENCE STATEMENT] (stating that "[a]s

and those at the World Conference on Preparing for Climate Change held in Cairo, Egypt, on December 21, 1989.<sup>118</sup>

Although the IPCC process is increasingly being relied upon as the appropriate international forum for debating the impacts of and responses to global warming, the difficulty of achieving agreement on specific issues is only just beginning. These difficulties include not only the "differing views" within the IPCC's Working Group III, but also the failed efforts to get the Noordwijk Ministerial Conference to endorse a specific cut in CO<sub>2</sub> emissions to stabilize them at 1988 levels by the year 2000. Such an agreement was blocked by the United States, the United Kingdom, the Soviet Union, and Japan,<sup>119</sup> with the United States indicating that it needed the results of the IPCC's science report—due by September 1990—before making such a commitment.<sup>120</sup> As a result, the final Noordwijk Declaration did not include a specific reduction in CO<sub>2</sub> emissions but stated only that the industrialized nations "agree that such stabilization should be achieved by them as soon as possible, at levels to be considered by the IPCC and the Second World Climate Conference of November 1990. . . . [and that in] the view of many industrialized nations such stabilization of CO<sub>2</sub> emissions should be achieved as a first step at the latest by the year 2000."<sup>121</sup>

#### *b. Toronto Conference: "Law of the Atmosphere" Model*

In addition to the IPCC effort, other preparatory work has been undertaken to develop a comprehensive "Law of the Atmosphere" con-

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many countries as possible should be encouraged to participate in the activities of the IPCC").

118. THE CAIRO COMPACT: TOWARDS A CONCERTED WORLD-WIDE RESPONSE TO THE CLIMATE CRISIS, held in Cairo, Egypt on Dec. 21, 1989, *reprinted in* SELECTED LEGAL MATERIALS, 5 AM. U.J. INT'L L. & POL'Y 631, 632 (1990) [hereinafter CAIRO COMPACT] (stating that "[t]o ensure success in these negotiations, governments should give strong support to the vital work of the Intergovernmental Panel on Climate Change").

119. N.Y. Times, Nov. 19, 1989, at 18.

120. See *News: Noordwijk Meeting Outcome*, Global Climate Change Dig., Dec. 1989, at 157 (stating that "[p]roposals to set a specific timetable for limiting emissions, supported by Western Europe and other countries, were opposed by the United States, Japan, Britain, and the USSR, which favor waiting until next fall for the outcome of the . . . (IPCC) before making specific commitments"); see also Thatcher UN Speech, *supra* note 111, at 6-7 (quoting Prime Minister Thatcher as saying, "[b]efore we act, we need the best possible scientific assessment: otherwise we risk making matters worse. . . . The United Kingdom has agreed to take on the task of coordinating such an assessment within the [IPCC], an assessment which will be available to everyone by the time of the Second World Climate Conference next year [1990]").

121. NOORDWIJK DECLARATION, *supra* note 101.

vention, modeled loosely after the Law of the Sea.<sup>122</sup> Under the leadership of Canada, the Toronto Conference on the Changing Atmosphere in June 1988 called for a comprehensive framework convention and protocols to protect the atmosphere.<sup>123</sup>

Following the Toronto Conference, a "Meeting of Legal and Policy Experts" was held in Ottawa, Canada, on February 20-22, 1989 to develop possible elements for a convention—both a broad Atmospheric Convention and a narrower Climate Change Convention.<sup>124</sup> The Statement of the Legal and Policy Experts takes the position that, in addition to developing a climate change convention, "work on principles for a framework convention on protection of the atmosphere should proceed."<sup>125</sup> The Statement sets forth 24 substantive and procedural elements that need to be addressed in a convention protecting the atmosphere.<sup>126</sup> The Statement also addresses additional "considerations and elements" for a specific convention on climate change.<sup>127</sup>

The Law of the Atmosphere approach has been criticized for being overly ambitious and slowing agreement on steps needed to begin reducing greenhouse gas emissions. The British Ambassador to the UN, Sir Crispin Tickell, has remarked that:

There are many here and elsewhere who would like to look forward to a Law of the Atmosphere on the same lines as the Law of the Sea. To them I counsel caution. The Law of the Sea conference was not a total success, and many governments including those of the United States and Britain, could not accept the results. . . . For the moment it would surely be better for international work to begin without encumbering the debate with the apparatus of draft conventions and treaty making. Instead, we should adopt a step by step approach.<sup>128</sup>

The Law of the Sea took nine years to negotiate; seven years later it still has not entered into force.<sup>129</sup> In contrast, the Vienna Convention

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122. TORONTO CONFERENCE STATEMENT, *supra* note 1.

123. *Id.* paras. 4 & 5.

124. PROTECTION OF THE ATMOSPHERE: INTERNATIONAL MEETING OF LEGAL AND POLICY EXPERTS, held in Ottawa, Ontario on Feb. 20-22, 1989, *reprinted in* SELECTED LEGAL MATERIALS, 5 AM. U.J. INT'L L. & POL'Y 529 (1990) [hereinafter OTTAWA STATEMENT OF LEGAL EXPERTS].

125. *Id.* para. (c).

126. *Id.* para. A.1.-24.

127. *Id.* para. B.1.-11.

128. Remarks of Sir Crispin Tickell, *Proceedings of the Second North American Conference on Preparing for Climate Change* 4 (Dec. 6-8, 1988), Climate Institute, Washington, D.C.; see T.A. Siddiqi, *Towards a Law of the Atmosphere Using Concepts from the Law of the Sea*, Working Paper No. 12, (Aug. 1988) (available from the East-West Center, Univ. of Hawaii School of Law) (contending that "[t]he time is ripe to take an approach similar to that for the Law of the Sea and call a global conference to draw up a Law of the Atmosphere").

129. See Sand, *supra* note 52, at 10-11.

and the Montreal Protocol were concluded relatively quickly, and implementation of them is ahead of schedule.<sup>130</sup> On the other hand, the Montreal Protocol has been signed by only 46 out of more than 160 states and the ozone problem is still far from being solved, due in large part to the lack of participation by developing states.<sup>131</sup>

*c. The Hague Declaration and Other Innovative Proposals*

Although both the U.N.'s IPCC effort and the Toronto conference are looking to familiar models for guidance, a more innovative, if not revolutionary, approach has been taken in the Hague Declaration.<sup>132</sup> In the words of French President Francois Mitterrand, the Declaration implies "the idea of renouncing a bit of national sovereignty. . . ."<sup>133</sup> The 24 heads of state signing The Hague Declaration agreed upon several principles, including:

The principle of developing, within the framework of the United Nations, new institutional authority, either by strengthening existing institutions or by creating a new institution, which, in the context of the preservation of the earth's atmosphere, shall be responsible for combating any further global warming of the atmosphere and shall involve such decision-making procedures as may be effective even if, on occasion, unanimous agreement has not been achieved.<sup>134</sup>

The new institutional authority would "develop instruments and define standards to enhance or guarantee the protection of the atmosphere and monitor compliance."<sup>135</sup> The Hague signatories also agreed upon the need for "appropriate measures to promote the effective implementation of and compliance with the decisions of the new institu-

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130. *Id.* at 11.

131. See Ramakrishna, *Ensuring South's Participation*, (paper presented at the Meeting of the World Resources Institute Policy Panel on Responses to the Greenhouse Effect and Global Climate Change) (Washington, D.C.: May 9-10, 1989) (explaining that "[a] recent study by WRI pointed out that even if nations follow the Montreal Protocol to the letter, the net emissions of ozone depleting substances will rise by 50% instead of a decrease by the same percent by the year 2000). This figure was arrived at after calculating potential remitted use of CFCs in only four developing countries: Brazil, China, India and Indonesia. *Id.*

132. DECLARATION OF THE HAGUE, *supra* note 90.

133. Cody, *Global Environmental Power Sought*, Wash. Post, Mar. 12, 1987, at A27. Then-Prime Minister Gro Harlem Brundtland of Norway remarked about GLOBE that "[t]he principles we have endorsed are in fact radical, but anything less would not serve us." *Id.*

134. DECLARATION OF THE HAGUE, *supra* note 90, para. (a). The Hague Declaration was signed by representatives from Australia, Brazil, Canada, Egypt, Federal Republic of Germany, France, Hungary, India, Indonesia, Italy, Ivory Coast, Japan, Jordan, Kenya, Malta, Netherlands, New Zealand, Norway, Senegal, Sweden, Tunisia, Venezuela, and Zimbabwe. *Id.*

135. *Id.* para. (b).

tional authority, decisions which will be subject to control by the International Court of Justice."<sup>136</sup> Finally, the Hague Declaration included the "principle that countries to which decisions taken to protect the atmosphere shall prove to be an abnormal or special burden, in view, *inter alia*, of the level of their development and actual responsibility for the deterioration of the atmosphere, shall receive fair and equitable assistance to compensate them for bearing such burden."<sup>137</sup>

The Hague signatories also discussed, though they did not formally include in their declaration, a proposal by French, Dutch, and Norwegian officials for a new organization referred to as "GLOBE," which would have had among its powers that of imposing sanctions on states violating its standards and decisions.<sup>138</sup>

Relying explicitly on The Hague Declaration, New Zealand also has called for the creation of a new institution to deal with climate change—an Environmental Protection Council.<sup>139</sup> The proposed Council would not replace UNEP or other existing organizations, "but it would have new functions making it the equivalent of a legislature. . . [and] would be empowered to take binding decisions."<sup>140</sup> The Hague Declaration also envisaged judicial controls to be used in securing compliance with binding decisions.<sup>141</sup>

Although it did not go as far as The Hague Declaration, the Noordwijk Ministerial Conference took note of the need for "appropriate decision making procedures and powers."<sup>142</sup> The Noordwijk Conference also recognized that the effort to draft a climate change convention would benefit from considering not only the "relevant aspects of the Vienna Convention," but also "innovative approaches as may be required by the complex character of the problem."<sup>143</sup>

One such innovative proposal is to establish a trusteeship for the global commons, including the atmosphere, by restructuring the U.N. Trusteeship Council. Maurice Strong, the President of the World Federation of United Nations Associations, has noted that "ecological is-

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136. *Id.* para. (c).

137. *Id.* para. (d).

138. Cody, *supra* note 133, at A27, A33.

139. New Zealand Delegation Comments to IPCC, IPCC/WG3-II/Doc.2, in *Report of the Second Session of IPCC Working Group III/Response Strategies Working Group (RSWG) 1* (Oct. 2-6, 1989) [hereinafter New Zealand Delegation Comments to IPCC]; see General Debate Statement at the 44th Session of the United Nations General Assembly, at 13-14 (Oct. 2, 1989), (statement of The Right Honorable Geoffrey Palmer, Prime Minister of New Zealand).

140. New Zealand Delegation Comments to IPCC, *supra* note 139.

141. *Id.* at 3.

142. NOORDWIJK DECLARATION, *supra* note 101.

143. *Id.*



sues bear upon the security of our entire planet and the survival of its inhabitants . . . [and are] closely related to the management of the global commons, the oceans, the atmosphere, and outer space."<sup>144</sup> In light of this, Mr. Strong has suggested that the U.N. Trusteeship Council could be "revitalized, given a new mission and a new mandate as the forum within which the nations of the world exercise their trusteeship for the integrity of the planetary systems on which our security and survival depends, as well as for the global commons."<sup>145</sup> If such functions were added to its mission, the Trusteeship Council "could make an extremely important contribution to the capacity of the United Nations to act as the principal instrument through which the nations of the world cooperate to ensure their common security."<sup>146</sup>

### III. PARTICIPATION BY DEVELOPING STATES IN THE INTERNATIONAL LEGAL RESPONSE TO GLOBAL WARMING

Global warming is, by definition, a global problem that will ultimately require a global solution. It demands the full participation of the developed states, who historically have been responsible for the bulk of the greenhouse gases released into the atmosphere,<sup>147</sup> and the developing states, who are continually increasing their contribution to the problem of global warming.<sup>148</sup> If developing states do not fully participate in formulating the international response to global warming, including the current effort to draft a framework convention, and do not become parties to an international agreement, they will continue to rely on the wasteful technologies that are significantly contributing to

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144. Address by Maurice F. Strong, National Conference on "Peacemaking and Peacekeeping: Canada and the United Nations," Dalhousie University, Halifax, Nova Scotia, June 5, 1988, at 17 (on file at the office of the American University Journal of International Law and Policy).

145. *Id.*

146. *Id.*

147. See Rind, *A Character Sketch of Greenhouse*, 15 EPA J. 4, 7 (1989) (declaring that the United States, for example, is responsible for 21% of the total annual contribution of greenhouse gases, the Soviet Union 14%, and the European Economic Community Countries 14%, for a total of 49%); TORONTO CONFERENCE STATEMENT, *supra* note 1 (stating that while climate change is caused by prosperous nations, the effects are suffered most acutely by the poor).

148. See U.S. ENVIRONMENTAL PROTECTION AGENCY, POLICY OPTIONS FOR STABILIZING GLOBAL CLIMATE, NO. IX 6 (draft report to Congress) (Feb. 1989) [hereinafter POLICY OPTIONS FOR STABILIZING GLOBAL CLIMATE] (setting out the contribution of greenhouse gases by geographic region). The contribution expected from the developing states if development continues as planned and no action is taken to reduce greenhouse gases is 42% of the total annual contribution by the year 2000, and 56% by the year 2020. *Id.*

global warming.

As demonstrated by the IPCC and the many strongly-worded declarations and conference statements discussed above, the community of advanced industrialized states clearly recognizes the threat posed by global warming, and increasingly, the need to gain the participation and agreement of the developing states.

Despite this recognition, however, the vast majority of the developing states are not yet participating in the preparatory work for a framework convention. UNEP Director Dr. Mostafa Tolba noted that in "many developing countries there is a lack of awareness among governments of the problems we are going to face" from global warming, which "stems partly from the fact that developing countries lack the facilities to collect the information on the global warming effect, and partly from the inability of these countries to disseminate information internally on what faces us unless we slow this effect down."<sup>149</sup> Dr. Tolba added that "financial and technical assistance, education, and other concrete support mechanisms were needed immediately. . ." to assist developing states, and that this "would necessitate large sums of money."<sup>150</sup> He estimates \$1,000,000 just for travel for five experts from each of 20 priority states through the draft of the first report of the IPCC.<sup>151</sup>

In response to the problem, the IPCC recently established a Special Committee on the Participation of Developing Countries.<sup>152</sup> The Committee's initial recommendations, which have been endorsed by the IPCC, include travel support for invited experts, "crash seminars" for opinion leaders in developing countries, and the establishment of national climate committees to integrate climate change into national development planning.<sup>153</sup> The priority developing countries are to be selected on the basis of how seriously they will be affected by global warming and sea-level rise, whether national action can have a major

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149. World Climate Change Report (BNA) 10-11 (Nov. 1989).

150. WMO/UNEP Intergovernmental Panel on Climate Change, at 2, (Nairobi, June, 28-30, 1989), Report of the Second Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC) [hereinafter Report of Second IPCC Session]. Dr. Tolba also noted that "[e]ven if all of the pledges were paid, the expenses for 1989 would barely be covered; nothing would be left over for 1990." *Id.*

151. *Id.* Annex IV.

152. Intergovernmental Panel on Climate Change, *Report of the First Session of the IPCC Special Committee on the Participation of Developing Countries*, Washington, D.C. (Feb. 5-7, 1990), IPCC-III/Doc. 5, IPCC/SCD-II/Doc. 2 (5-1-1990). The Special Committee is comprised of representatives from Brazil, France, which serves as the chair, India, Indonesia, USSR, Japan, Kenya, Norway, Saudia Arabia, and the USA, as well as UNEP, WMO, and the IPCC itself. *Id.* Annex I.

153. *Id.* at 1, 2-6.

impact on greenhouse emissions and storage, whether they have special expertise, and whether they are centers of major regional projects with participation from more than one state.<sup>154</sup>

Notwithstanding these plans, the preliminary but critical preparatory meetings currently underway are proceeding largely without the developing states. For example, of the 43 states sending representatives to the October 1989 meeting of the IPCC's Working Group III, which is charged with the formulation of response strategies, fewer than half were from developing states;<sup>155</sup> and of the 23 states contributing to the draft of the possible elements for a convention at the October meeting, only the Maldives, Zimbabwe, and Libya can be characterized as less developed.

Ironically, the otherwise welcome speed to develop a global warming convention may prove to be a disadvantage—unless far greater effort is made to gain the full and effective participation of developing states. It is not enough for the developed world to “pay special attention” to the developing states, nor to promise the transfer of technology and financial aid in the future.

What is needed is immediate assistance to enable the developing states to participate in the international response to global warming, so they can prepare their own response,<sup>156</sup> and develop their own negotiating strategies (which may include using the ICJ, as well as preparing their own draft convention). Many developing states, perhaps as many as sixty, have neither a full-time foreign office or state department with international legal experience, nor an expert on complex international environmental issues, such as global warming. Similarly, many do not have the scientific expertise to determine the validity of the current models being used to predict global warming, nor to determine the expected impacts on their particular state, including the impacts of sea-level rise.

Assuming they are able to participate fully in the convention process, the developing states will have a remarkable, if not unparalleled, oppor-

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154. Report of Second IPCC Session, *supra* note 150, at Annex IV, para. 2.

155. Report of the Second Session of IPCC Working Group III/Response Strategies Working Group (RSWG) at para. 4.1.5 (Geneva, Oct. 2-6, 1989).

156. See TOKYO CONFERENCE STATEMENT, *supra* note 117. The Tokyo Conference Statement calls for assistance to developing countries to ensure participation in the climate change assessment process now underway by the Intergovernmental Panel on Climate Change (IPCC) under the auspices of the UN. *Id.* at III (h)(i). The Tokyo Conference Statement also calls for “(ii) adequate training of scientists and administrators, . . . (vi) effective analysis of regional impacts . . . and the preparation of national and regional responses, and (vii) observation of their own climate and environmental factors”). *Id.* at III (h)(ii),(vi) & (vii).

tunity to address a wide range of important issues in the development of any new international instrument on global climate change. The developing states have already begun to identify their separate interests, focusing on access to experts and technology, training of indigenous experts, and financial assistance. Grants without conditions, rather than loans, are desired, and in an amount that provides a net addition of funds rather than a reprogramming of existing aid.

A central issue for many developing states will be how to obtain compensation for the opportunity costs they will incur from foregoing or altering their development.<sup>157</sup> This compensation must include the transfer of more efficient industrial technologies and sufficient financial aid and debt relief to allow developing states to achieve sustainable development.<sup>158</sup>

The suggestion that the developed world should immediately assist the developing states acquire the scientific and legal expertise needed to participate in the international legal process is based upon two assumptions. The first is that experts will be able to agree more quickly than politicians on the necessary elements of a global warming convention, and thus provide the foundation for political agreement, as suggested by previous experience with measures to protect the ozone layer. The second is that early and equitable participation by the developing states in drafting and negotiating a global warming convention will increase the possibility that they will ultimately accept the international agreement.

If these assumptions are correct, the industrialized world will benefit from providing aid to the developing nations because this aid will speed the process for achieving an equitable framework convention on global warming. The ultimate goal, of course, is not only the formation of a convention, but a convention which is accepted by all of international society. Full participation from the outset—by all of international society—is the most certain way to achieve this goal.

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157. See, e.g., DECLARATION OF THE HAGUE, *supra* note 90, para. (d) (stating that mechanisms must be developed to compensate developing countries for taking on the special burden of atmospheric deterioration).

158. In 1988 the WorldWatch Institute made rough estimates of additional expenditures to meet essential targets for sustainable development by the year 2000: annual expenditures of \$46 billion by 1990, increasing to \$145 billion annually in 1994, and \$150 billion in 2000. MacNeill, *Strategies for Sustainable Economic Development*, SCI. AM., Sept. 1989, at 155, 162-64. This should be compared with the cost of the worldwide reduction in agricultural productivity from the global warming that will follow a doubling of CO<sub>2</sub>: the U.S. Department of Agriculture estimates the annual net cost to be from \$35 to \$170 billion. Passell, *Economic Scene, Global Warming: Look or Leap?*, N. Y. Times, Feb. 14, 1990, at D2.

## CONCLUSION

The threat of global warming—a problem which eventually may threaten the very survival of the planet and which, even now, threatens global security—will severely test the international legal process. Global warming is, by its nature, a problem involving all of international society, as both emitters of greenhouse gases and as victims of the consequences of these emissions. As such, its solution also must be global, and involve all of international society.

While all states may contribute to global warming, the volume of that contribution, and the attendant responsibility, is not equal. A handful of the most industrialized states are responsible for the vast majority of the greenhouse gases, other rapidly industrializing states are adding considerable to the volume, while the small developing states produce negligible greenhouse gases, rendering these states relatively blameless.

Similarly, the ability to respond to global warming is not equal; the highly industrialized states have the technology, expertise, and financial might to reduce greenhouse gases and adapt to the consequences, while many developing states have neither the technology, the expertise, nor the financial ability for such response.

Finally, the impacts of global warming will not universally impact all nations in similar ways. The low-lying island and coastal states will be the earliest and hardest hit by global warming and the resulting sea-level rise. Some are threatened with the loss of their entire territory, while many others will lose part of their territory to erosion and periodic flooding. These states potentially have a great deal to lose from global warming and sea level rise, and much to gain from using the international legal process. Indeed, there is little else they can do.

## THE POTENTIAL OF THE JUDICIAL PROCESS   ^

One strategy for seeking protection and assistance is through the use of the ICJ. Admittedly, the problems presented by global warming and sea-level rise are beyond the scope of most issues historically considered by the Court, but the world has changed (or rather, humankind has changed it). As one author writes, we may be experiencing the “end of nature” caused by global warming and other forms of environmental degradation.<sup>159</sup> In order to face problems of the magnitude of global

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159. See McKibben, *Reflections: The End of Nature*, NEW YORKER, Sept. 11, 1989, at 47, 50. Referring primarily to global climate change, the author writes that: Our comforting sense, then, of the permanence of our natural world—our confidence that it will change gradually and imperceptibly, if at all—is the result of a

warming, established orthodoxies concerning the preeminent status of the sovereign state are being challenged. This generalized political will for change is affecting the international legal process as consciousness evolves and as new meaning and purpose are given to international law in a newly conceived international society.<sup>160</sup>

Under these circumstances, whether the ICJ can rise to the challenge to provide a forum for the resolution of global warming disputes and protect the victim states vulnerable to sea-level rise is a serious question. Although the possibility may be unlikely, the Court may be willing and able to respond; indeed, it may even be willing to evolve as an institution so that it may play a significant role in addressing the planet's environmental problems. This option must be explored.

The Court cannot, however, act alone. Willing and creative states must present a case, or one of the relevant U.N. organs must request an advisory opinion, before the Court can act. This requires significant scientific and legal expertise costing enormous sums of energy, time, intellect, and money. For many of the small low-lying states, obtaining this kind of assistance requires advocates and scientists to provide their assistance *pro bono* or the Court to provide a legal aid fund.<sup>161</sup>

Given such an opportunity, if the Court does not respond and evolve, international society must carefully reconsider what judicial processes and institutions are appropriate for addressing global warming and the other inevitable international environmental threats that loom on the horizon. A new International Environmental Court may be needed to address the special problems of international and transboundary environmental problems. In such a case, the ICJ would miss an opportunity to carve for itself the central role in international society its supporters have historically advocated. Other new institutions may also be needed to deal effectively with the complexities of international environmental problems. These institutions may include a global prosecutor or a trustee of the global commons with the power to investigate and prosecute environmental violations.

Even at the reaches of its evolutionary and creative possibilities to resolve global warming disputes and similar international environmen-

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subtly warped perspective. Changes in our world which can affect us can happen in our lifetime—not just changes like wars but bigger and more sweeping events. Without recognizing it, we have already stepped over the threshold of such a change. I believe that we are at the end of nature.

160. P. ALLOTT, *supra* note 3.

161. To create a legal aid fund for the ICJ presumably would require an amendment of the statute of the Court, and while such an amendment would be welcome, finding political support from the current parties to the statute may be difficult at this time.

tal problems, the ICJ will play only a supporting role. Far more is needed from the international legal process, and it can come only from the creation of new legal principles and perhaps new institutions.

### THE CONVENTION PROCESS

The most promising international response to global warming will be found in the law-making function of the international legal process. A global warming convention is essential, and, judging by the developments to date, inevitable in one form or another.

While much preparatory work has been done by the IPCC and other bodies, as well as by conferences and meetings of experts, the actual task of drafting and negotiating a global warming convention has not formally begun.<sup>162</sup> Under the circumstances, it seems far too early to begin narrowing the options concerning relevant models or relevant institutional structures. Both the Vienna Convention and the Law of the Sea should be considered as models for the Convention; the creation of new institutions, including GLOBE, a trustee for the global commons, and a new U.N. Environmental Protection Council should also be included for discussion.<sup>163</sup>

Merely listing the elements for a framework convention, as the IPCC is charged with doing, is of limited value. Rather, it is how those elements are stitched together into the whole of the framework convention that will be important, and the ultimate acceptance of that whole.

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162. The IPCC is charged with preparing a "list of elements" for a convention. (*Draft*) *Report of the Third Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, Feb. 1990, at 22, para. 3.3.12. The legal issues being addressed by Working Group III will continue to be refined until April 1, 1990, at which time the Working Group hopes the legal issues paper will be available to provide "a road-map for negotiation of the framework climate convention by laying out clearly those issues that require negotiations." *Id.* para. 3.3.13.

As of the Third Plenary Session of the IPCC February 5-7, 1990:

There is consensus that, at a minimum, the convention should set forth principles of co-operation, provide a legal and institutional framework for monitoring and assessing climate change and for developing and implementing responses. The convention and its protocols should deal with the special circumstances of developing countries, including mechanisms for providing financial assistance. Some nations have suggested that binding commitments and control measures also be included in a framework convention.

*Id.* at 21-22, para. 3.3.12.

The work on the convention, however, may be shifting from the IPCC process to the process established under the 1992 Stockholm review conference, and ultimately of course into the hands of the separate states. *Id.* at 15-16, para. 2.4.

163 See *General Debate Statement at the 44th Session of the United Nations General Assembly*, at 13-14 (Oct. 2, 1989) (statement of The Right Honorable Geoffrey Palmer, Prime Minister of New Zealand) (proposing a new organ within the UN system called the "Environmental Protection Council.")

There are, nevertheless, two broad principles that should be emphasized—the precautionary principle and sustainable development. The precautionary principle is designed to institutionalize caution and to ensure that society evaluates the threats it imposes on the environment prior to adopting adverse actions. This principle must be coupled with the principle of sustainable development, to help ensure the twin goals of environmental protection and development. This is a daunting challenge. As the Prime Minister of New Zealand recently suggested to the U.N. General Assembly:

“The UN even may need to consider the possibility that, within the limitations of present technology, if development is to be sustainable, it must be rationed. In other words: that humanity has reached the point in history where sustainable development is only possible if “rights to pollute are allocated.”<sup>164</sup> It is hoped that these two principles will be a prominent part of any convention, and in general, any future developments in environmental law. In addition to limiting greenhouse gases, and correcting the disturbances to our climate, we must ensure that any such threats are not repeated.

As legal principles, such as those discussed above, are being selected and given specific legal content and as new institutions are being debated, states are forming negotiating compacts. These negotiating blocks between various categories of states (for example, the most highly industrialized states, the rapidly developing states, and the least developed states), are being developed to establish group positions and formulate and coordinate negotiating strategies.

The low-lying coastal and island states are increasingly recognized as having a unique vulnerability to sea-level rise warranting separate consideration in the convention process. There is general recognition that financial assistance will have to be provided if these states are to participate fully in the convention process. To date, however, there has been little progress made toward providing such assistance for the low-lying states—or for any of the other developing states in need of assistance, and this does not bode well for the future. By being excluded, for financial reasons, from the IPCC process, these states have less sense of the urgency of the problem, less confidence in the scientific predictions of global warming and specific impacts, a less informed citizenry, and ultimately, less political will to tackle the issue in a framework convention.

Many aspects of this problem might be solved with the assistance of

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164. *Id.* at 11.



NGOs. Public interest environmental organizations, which are accustomed to providing their assistance *pro bono*, should be willing to offer their assistance to developing states. Until international society provides environmental organizations with a larger and more official role in the international legal process, including standing to bring actions in the ICJ, such groups will find it to their advantage to work in partnership with states. Assistance also might be provided by grant-making institutions, law schools and universities, and private law firms, many of whom have existing *pro bono* programs. Consulting firms with scientific expertise and private corporations might also find avenues to help assist developing countries. In summary, all of international society must help find a solution.

*Pro bono* assistance will solve only part of the problem, however, as the problem is not only how developing states can participate in the process, but how they can be assisted in avoiding the wasteful development paths taken by the more industrialized countries and how they can be assisted in making the transition to sustainable development. While perhaps \$20 million would enable developing states to participate fully in the convention, it will take hundreds of billions of dollars to help them achieve a sustainable society (and to adapt to the inevitable consequences of the warming already underway). Furthermore, developed states should not assume these problems are strictly all "over there," referring to the isolation of these problems in developing states. The developed states must get their own house in order before their calls for the developing countries to abandon the traditional development path will carry any moral authority. Developed countries must likewise pursue environmental protection and economic development through limits imposed by the precautionary principle and sustainable development.

The developed world has profited greatly from the industrialized processes that cause global warming; it will have to use some of its wealth to help the less economically advantaged states avoid and reduce their use of these wasteful technologies. As a start, developed nations should immediately ensure the participation of the disadvantaged states in the convention process. This relatively small gesture would send a vital message of cooperation and partnership to the developing states, befitting the global nature of the issue.

## APPENDIX A

## IPCC LIST OF ELEMENTS

1. Preamble
  2. Definitions
  3. General Obligations
  4. Institutions
  5. Research and Systematic Observations
  6. Information Exchange and Reporting
  7. Technology Transfer
  8. Consultation
  9. Settlement of Disputes
  10. Other Provisions
  11. Annexes and Protocols
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## APPENDIX B

TORONTO EXPERTS LIST OF ELEMENTS: FRAMEWORK  
CONVENTION ON PROTECTION OF THE ATMOSPHERE

1. Atmosphere
2. Atmospheric Interference
3. Common Resource of Vital Interest
4. Obligation to Protect and Preserve the Atmosphere
5. Sovereign Right of States to Permit Human Activities and the Limits Thereto
6. Implementation of the Convention Through Protocols
7. Measures to Prevent, Reduce or Control
8. No Transfer of Damage or Hazards or Transformation of One Type of Atmospheric Interference Into Another Interference
9. Additional Domestic Measures
10. Bilateral, Multilateral or Regional Agreements and Arrangements
11. General Obligation to Cooperate
12. Policies and Strategies
13. Exchange of Information
14. Research and Systematic Observations
15. Development and Transfer of Technology
16. Prior Notice and Environmental Impact Assessment of Planned Activities
17. Consultations
18. Emergency Situations

19. Liability, Compensation or Other Relief
  20. Peaceful Settlement of Disputes
  21. World Atmospheric Trust Fund
  22. Co-ordination of Existing Institutional Arrangements
  24. Participation in the Convention
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## APPENDIX C

### TORONTO EXPERTS LIST OF ELEMENTS: ADDITIONAL CONSIDERATIONS AND ELEMENTS FOR A CONVENTION ON CLIMATE CHANGE

1. General Approach
2. Possible Protocols
3. Monitoring
4. Reporting
5. Conference of the Parties
6. Secretariat
7. Experts Panel
8. Budget Fund
9. World Climate Trust Fund
10. Participation by Developing Countries
11. Nature of Obligations