THE GLOBAL WARMING NEGOTIATIONS: A COMMENTARY ON THE CONSTITUTIVE PROCESS OF INTERNATIONAL ENVIRONMENTAL LAW*

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I. INTRODUCTION

Global warming has been declared the greatest crisis ever faced collectively by the human community, threatening the very survival of civilization.[1] Others however argue that the international community is in danger of becoming "a victim of its own hysteria,"[2] that global warming is an unproven environmental threat.[3]

No matter how one perceives the dangers of global warming, stabilizing the world's climate presents an unprecedented challenge to the global community. The climate changes the world has seen and the even more feared projected changes in the future has compelled everyone from government leaders to the general public to realize that we inhabit a single planet and share responsibility for its health. National differences and old rivalries will have to be cast aside. And because the problem is so overwhelming and the time so short, the international community has been forced to undertake unprecedented levels of cooperation, acting as a common society like never before.[4]

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[1]INTERNATIONAL CONFERENCE ON GLOBAL WARMING AND CLIMATE CHANGE: PERSPECTIVES FROM DEVELOPING COUNTRIES, New Delhi, India (February 21-23, 1989), reprinted in *"Selected International Legal Materials on Global Warming and Climate Change"*, 5 AM. U.J. INT'L. POL'Y 543 (1990) [*hereinafter* referred to as SELECTED MATERIALS].

[2]Solow & Broadus, *Global Warming: Quo Vadis*, 14 THE FLETCHER FORUM 262 (1990).

[3]*Where Sununu Stands*, N.Y. Times, September 10, 1991, at C9.

[4]C. Flavin, *Slowing Global Warming: A Worldwide Strategy*, Worldwatch Paper '91 (October 1989), at 63.

1. *A "Common Interest" Perspective*

In this paper, the global warming crisis and the evolution of international environmental law will be analyzed from the standpoint of "common interest," the perspective that is "most indispensable to a public order of human dignity."[5] This perspective is "the demand for the continuing clarification and implementation of common interests in regard to all values,"[6] which, "from a structural standpoint, implies that the competence to clarify the common interest is itself a matter of common interest."[7]

It has been pointed out that the claims of states and other participants in the international decision process can be characterized "however they justify themselves, in terms of common or special interests."[8] Common interests are those which serve the interests of the entire world community while special interests do not, "but are asserted irrespective of the interests of others."[9] According to McDougal and Reisman,

> Where demands for comparatively high or complete national control serve the interests of the world community, we term them common exclusive interests to distinguish them from both special interests and claims for more inclusive or shared control. In a public order aspiring towards human dignity, the demands of participants in transnational prescriptive processes must achieve, above all, a commitment to common interests and a rejection of special interests. It is within this broad commitment that an accommodation must be sought between the inclusive interests of many participants and the exclusive interests of particular participants.[10]

Applied to the global warming phenomenon and to international environmental law, this "common interest" perspective demands an international constitutive process "in which the continuing competence of the general community to decide what the common interest is will take priority over all special interests."[11] Whether or not the constitutive process reflected in the global warming negotiations, in

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[5]M. McDougal & W. Reisman, *The World Constitutive Process of Authoritative Decision*, in INTERNATIONAL LAW ESSAYS 191, 206 (1981).

[6]*Id.*

[7]*Id.*

[8]McDougal & Reisman, *The Prescribing Function In The World Constitutive Process: How International Law Is Made*, in INTERNATIONAL LAW ESSAYS, 355, 373 (1981).

[9]*Id.*

[10]*Id.*

[11]*Id.*

particular, and international environmental law, in general, has evolved or is evolving towards conformity with the "common interest" standard is the principal question posed in this study. More specifically, the respective positions of the important actors in the ongoing climate negotiations will be evaluated on whether their respective commitments are to common interests or only to their own special interests.[12]

2. *Overview*

This paper will have three major sections.

Part II will discuss the global warming crisis: the scientific definition and description of this phenomenon; its projected and feared consequences; the state of the scientific debate on the phenomenon; the causes and parties responsible for the crisis; and the characteristics of global warming as an international issue.

Part III focuses on the international response to global warming. Particular attention will be given to the varying responses of the different state actors in the world community - Western Europe and Japan, the United States, and the developing states. The responses of non-state actors such as intergovernmental institutions, like the United Nations and its agencies, and non-governmental organizations, domestic and international, will also be given attention. The state of the ongoing international negotiations for a world climate treaty will also be discussed in this section. Finally, Part III, for purposes of comparison, concludes with a brief look at how the international community dealt with a similar issue in the very recent past - the ozone depletion problem - and the possible lessons that can be learned from that particular process.

Part IV discusses the constitutive process of international environmental law using insights from the preceding sections as starting points. The historical and contemporary role of international law in global environmental management will be discussed in this section. The

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[12]The original intent of this student was to write about global warming and international environmental law from the perspective of an international lawyer from a developing state. However, upon reflection and after going through the literature on these issues, this student became convinced that the "common interest" perspective is not only the academically correct standpoint - it is also the only perspective which, in the long run, makes sense whether one is from the North or the South. In these particular areas, the line between common interests and special interest has increasingly blurred. After all, global warming and other international environmental issues are precisely that - global and international - thus demanding a less ethnocentric standpoint.

emphasis of the analysis will be on the dynamics of North and South and the dynamics of states, intergovernmental institutions and non-government organizations in international environmental law. The section concludes with an attempt to show that the environmental issues faced by the world community demand the evolution of international environmental law from a state-oriented system to something more comprehensive and global.

The paper will end with an evaluation of whether or not international environmental law as it it is now evolving conforms to the "common interest".

II. THE GLOBAL WARMING CRISIS

The concept of global warming goes back over 200 years. That the Earth's surface has always been warm enough to keep the oceans from freezing and thus has permitted life to form and evolve is due to a few trace gases in the atmosphere that trap some of the outgoing infrared radiation that would otherwise escape to space.[13] Now human activity is adding more of these greenhouse gases to the atmosphere "turning up the global thermostat" - and gradually changing many other things on the Earth.[14]

The first scientist to formally propose that gases in the atmosphere could absorb some of the "heat radiation" the earth's surface is constantly emitting was Jean-Baptiste Joseph Fourier (1768-1830). This French scientist suggested that the Earth is kept warm by this process, in the same way the glass of a greenhouse keeps the interior warm on a cold day, and he called it "l'effet de verre" (the glass effect). This explains why global warming is also known as the greenhouse effect.[15]

It was however the Swedish chemist Svante Arrhenius who, in 1896, conceived of the notion that human activities might disrupt this delicate balance in the atmosphere.[16] Arrhenius theorized that the rapid increase in the use of coal in Europe since the industrial revolution would increase carbon dioxide concentrations and cause a gradual rise in global temperatures. This theory stirred little interest for decades since no one was sure whether carbon dioxide concentrations were actually increasing.[17]

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[13]GREENHOUSE GLASNOST 95 (T. Minger ed. 1990).
[14]*Id.*
[15]*Id.*
[16]Flavin, *supra* note 4, at 10-11.
[17]*Id.*

While the writings of Arrhenius were not entirely forgotten, they had little impact on scientific thinking for a long time. On the whole, except for a few discerning and concerned individuals, the scientific community and the public seemed oblivious to the possibility that human activity could influence the greenhouse effect and hence the temperature of the Earth.[18] This changed in the 1960s. Satellite reconnaissance, improved understanding of the oceans, and more sophisticated computer models have greatly broadened understanding of the complex forces at work in the world's climate. The advent of powerful computers allowed scientists to build models that simulate the phenomena that make up the global climate. The use of computer modeling in the early 1980s helped establish a consensus on the amount of warming that could be expected if carbon dioxide buildup continues for the next hundred years.[19]

1. The Scientific Phenomenon

Over the last 100 years, as a result mainly of human activity, the average annual surface temperature on this planet rose by half a degree celsius. With the unusually warm 1980s, the planet has warmed by a total of 0.7C. This rate of temperature change is unknown in recorded Earth history.[20] Global temperatures are now about 0.6 degrees celsius warmer than they were a century ago. While there is as yet no conclusive proof linking this recent heating to the greenhouse effect, circumstantial evidence has convinced many scientists that this is the cause. Scientists are more concerned, however, about the much faster warming that is predicted by a half dozen computer models - reaching 2.5-5.5 degrees celsius late in the 21st century.[21] In fact, the science group of the Intergovernmental Panel on Climate Change (IPCC), the international body tasked with studying the greenhouse effect, has concluded, in its 1990 and 1992 reports, that if business and industry continue operating as usual, global temperatures would increase by 0.3 degrees celsius per decade, "within an uncertainty range of 0.2-0.4 celsius."[22]

Whether a warming is detectable now is controversial; what is certain is that the 1980s was the warmest decade of the past century and

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[18]*See* GREENHOUSE GLASNOST, *supra* note 13, at 98; *See also* F. LYMAN, THE GREENHOUSE TRAP 9 (1990).

[19]Flavin, *supra* note 4, at 12.

[20]GREENHOUSE GLASNOST, *supra* note 13, at 35.

[21]Flavin, *supra* note 4, at 6.

[22]Hunt, *Estimates of Global Warming Scaled Down*, The Financial Times, 13 January 1992, at 5.

included six of the ten warmest years on record.[23] And if present trends continue, greenhouse gases will reach the equivalent of twice the pre-industrial levels of carbon dioxide within 40 years and will double again before the end of the 21st century. If current models of the earth's climate system are correct, even one doubling will raise global temperatures a few degrees centigrade.[24]

The prospective shift in temperatures may seem small, but it is nearly comparable to the change between the extreme climate of the last ice age, 18,000 years ago, and today's climate. It is enough to affect significantly rainfall patterns and temperature regimes in much of the world, with impacts on agriculture, forestry, and virtually all living things. Even an increase of two degrees would take temperatures higher than human societies have ever experienced.[25] And if contemporary patterns of industrial and agricultural activities that are the sources of these gases are not themselves transformed, there is a real possibility of large-scale climate change, forcing what could be very difficult adjustments.[26]

2. *Consequences of Global Warming*

Global warming is an environmental threat unlike any the world has faced. While human activities in the 20th century have damaged many natural systems, these have been usually local or regional in scope and can be reversed in years or decades if sufficient effort is exerted. Changes to the earth's atmosphere, on the other hand, are global and - for all practical purposes -"irreversible not only in our lifetimes but in our children's and grandchildren's as well."[27] And these changes, if the worst fears of many scientists are realized, would be terrible for many peoples in the world community. According to Flavin,

> some have suggested that "greenhouse effect" "and global warming" are mild terms for a coming era that may be marked by heat waves which would result into some regions virtually uninhabitable. Frequent droughts could plague areas of North America and Asia, imperiling their ability to meet food needs. Wetter, more violent weather is projected for other regions. Many forests could be at risk as climate

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[23]WORLD RESOURCES INSTITUTE, WORLD RESOURCES 1990-91: A GUIDE TO THE GLOBAL ENVIRONMENT 3-4 (1990) [*hereinafter* referred to as WORLD RESOURCES].

[24]*Id.*, at 3.

[25]*Id.*

[26]*Id.*

[27]Flavin, *supra* note 4, at 5.

> zones suddenly shift. And many low-lying areas with dense population or extensive agriculture will be threatened by rising seas.[28]

These temperature increases also have serious secondary consequences. The temperature rise of a few degrees Centigrade by the middle of the 21st century is predicted to cause a thermal expansion of seawater and, to a lesser extent, a melting of polar and glacial ice.[29] The consequence is a rise in sea level. Calculations suggest a worldwide average rise by a few tenths of a meter to a few meters by the second half of the 21st century. Still more dire consequences may follow, including the collapse of the west Antarctic ice sheet and the inundation of almost all coastal cities on the planet.[30] These estimates are especially relevant when one considers that approximately 30 percent of the earth's population lives in coastal regions within 50 kilometers of the water.[31] Sir Crispin Tickell, British Permanent Representative to the United Nations, describes what may happen in case such a rise in sea level indeed occurs:

> It requires a leap of imagination to work out the numbers that would be on the move in the event of global warming on present estimates. A heavy concentration of people is situated at present in low-lying coastal areas or along the world's great river systems. Nearly one-third of humanity lives within 60 kilometers of a coastline. A rise in mean sea level of only 25 centimeters would have substantial effects. The industrial countries might be able to construct new sea defenses to protect vulnerable areas, but even they would have difficulty in coping with high tides and storm surges of a kind that might be more common.
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> For most poor countries, such defenses would be out of the question. Many of those living and working in, for example, the delta areas of the Nile, the Ganges, and the Yangtse would be forced out of their homes and livelihood. Some islands, such as the Maldives in the Indian Ocean, and Kiribati, Tuvalu, and the Marshall Islands in the Pacific, would soon become uninhabitable.[32]

Although the entire world would be adversely affected by global warming, it will obviously be the low-lying, small, coastal and island States which will face a greater danger.[33] Sea-level rise would

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[28]*Id.*, at 6.

[29]GREENHOUSE GLASNOST, *supra* note 13 at 15-16.

[30]*Id.*

[31]*Id.*, at 40-41.

[32]*Id.*, at 188.

[33]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. These islands are rarely more than three meters above sea level and some are considerably less. Within only a few decades the islands of Kirbati could disappear beneath the Pacific, making refugees of the islands' 60,000 inhabitants. The Republic of Maldives, in the

cause extensive damage to the land and infrastructure of those countries and even threaten the very survival of some island states.[34]

As to number of people affected, Tickell estimated that if only one percent (a very low estimate) of a future world population of 6 billion were affected, that would still mean some 60 million migrants or environmental refugees; and 5 percent (again a low estimate) would produce 300 million.[35] The United Nations Environment Program (UNEP), on the other hand, estimates that a one meter rise in sea level could displace up to 15 million people in countries like Egypt and Bangladesh.[36]

If the predicted levels of warming occur, the changes would be extraordinarily rapid compared with most climactic shifts in history. In fact, "the changes may occur more rapidly than trees and other biota can adjust to new temperature regimes or migrate to new ranges" resulting into "disrupted ecosystems and accelerated extinction for many plant and animal species."[37] "Wind shear will become more dramatic and potentially devastating" and "aridization and dust from windblown erosion is likely to increase" damaging natural habitats and threatening human communities.[38]

Another area on which global warming will have a substantial impact will be access to food and water. Already, current levels of global food security are inadequate but even this will be most difficult to maintain into the future, given projected agricultural production levels and population and income growth rates. The climate changes envisaged will aggravate the problem of uncertainty in food security.[39] The irony is that climate change is being induced by the already prosperous, but its effects are suffered most acutely by the poor.[40]

Indian Ocean, is also vulnerable; a two-meter rise in sea level would flood the capital and over one-half of the populated atoll islands of the republic. The Pacific island nations of Tokelau, Tuvalu and the Marshall islands are similarly threatened. *See* Zaelke and Cameron, *Global Warming and Climate Change - An Overview of the International Legal Process*, 5 AM. U.J. INT'L. L. POL'Y 249 259-60 (1990).

[34]MALE DECLARATION ON GLOBAL WARMING AND SEA LEVEL RISE: SMALL STATES CONFERENCE ON SEA LEVEL RISE (Male, Republic of Maldives, 18 November 1989) in SELECTED MATERIALS, *supra* note 1, at 602.

[35]GREENHOUSE GLASNOST, *supra* note 13, at 189.

[36]*Id.*, at 199.

[37]WORLD RESOURCES, *supra* note 23, at 4.

[38]GREENHOUSE GLASNOST, *supra* note 13, at 198.

[39]THE CHANGING ATMOSPHERE: IMPLICATIONS FOR GLOBAL SECURITY, in SELECTED MATERIALS, *supra* note 1, at 519.

[40]*Id.*

Finally, as to the United States, the U.S. Environmental Protection Agency summarized the effects of global warming:

> The findings collectively suggest a world different from the world that exists today, although there are many uncertainties about specific effects. Global climate change could have significant implications for natural ecosystems; for where and how we farm; for the availability of water to irrigate crops, produce power, and support shipping; for how we live in our cities; for the wetlands that spawn our fish; for the beaches we use for recreation; and for all levels of government and industry.[41]

Global warming will, however, not evenly impact the Earth's surface, but will vary throughout the different regions of the world. This implies that perceptions and responses of countries to global warming will likely vary, even among those countries which acknowledge the existence of the phenomenon and the seriousness of its consequences.[42] Although this issue must be dealt with globally, "it divides the nations of the world and the internal constituencies within them."[43] The uneven distribution of fossil fuels and of potential climate changes ensures that there will be losers and gainers.[44]

3. *Global Warming and Scientific Uncertainty*

With the consequences described in the preceding section, it would seem that there is no reason why the world community should hesitate before taking drastic action now. The problem, and this is the reason cited by those who would oppose a comprehensive international response to global warming, is that there continues to be great uncertainty, associated with current models and data, within the scientific community.[45] There is much debate on the extent of the warming and its consequences. There is also uncertainty about the global and regional distribution of climate change partly because the existing climate models provide crude treatment of hydrological processes and partly because research tends to ignore the roles of deep oceans.[46]

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[41]J. Smith and D. Tirpak, THE POTENTIAL EFFECTS OF GLOBAL CLIMATE CHANGE ON THE UNITED STATES, DRAFT REPORT TO CONGRESS 67 (1988).

[42]Nanda, *Global Warming and International Environmental Law - A Preliminary Inquiry*, 30 HARV. INT'L L.J. 375, 379 (1989).

[43]Perry, *International Organizations and Climate Change* in WORLD CLIMATE CHANGE: THE ROLE OF INTERNATIONAL LAW AND INSTITUTIONS 33, 41 (V. Nanda ed. 1983) [*hereinafter* referred to as WORLD CLIMATE CHANGE].

[44]*Id.*

[45]Nanda, *supra* note 42, at 379.

[46]*Id.*, at 380.

There are however generally accepted facts about global warming. First, although there is much argument about the exact climatic effects of adding greenhouse gases to the atmosphere rapidly, there is no dispute that the greenhouse phenomenon itself - the trapping of heat by atmospheric gases - is a reality. Second, the atmospheric concentrations of greenhouse gases are rising at unprecedented rates which, in many cases, show signs of accelerating even further. No scientist disagrees that we are altering our atmosphere very rapidly. Third, historically, changes in greenhouse gas concentrations are closely related with changes in the earth's surface temperature.[47]

These three known facts about global warming - "that the greenhouse effect is real, that levels of greenhouse gases are rising at unprecedented rates, and that greenhouse gas concentrations have tracked global climate change closely in the past" - together with predictions of the latest climate models, have resulted in the consensus that indeed some global warming is likely within the next century.[48]

In a report submitted to the Second World Climate Conference held in Geneva on November 1990, the Intergovernmental Panel on Climate Change - summarizing the work done by 700 scientists and environmental specialists - concluded that:

> 1. Notwithstanding scientific and economic uncertainties, all countries should take immediate steps to reduce greenhouse gases and find more ways to absorb excess gases already in the atmosphere.
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> 2. Without such actions, global warming will increase between 2 and 5 degrees centigrade over the next century, a rate of change unprecedented in the last 10,000 years.
>
> 3. This warming could lead to a sea level rise between 35 and 65 centimeters in the next century. Although the range is large, it is prudent to take precautions.
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> 4. It is now technically feasible and cost-effective to reduce carbon dioxide emissions in all countries. There are enough opportunities for many industrialized countries to cut carbon dioxide by at least 20% by the year 2005 if they use energy more efficiently, employ alternative fuels and plant more forests to absorb carbon.

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[47]WORLD RESOURCES, *supra* note 23, at 19-20.
[48]*Id.*

> 5. It is vital to expand global observation systems and above all to establish a network to study the world's oceans - the main regulator of the world climate - which are poorly understood.[49]

There are those however who insist that more research be done before any action to stabilize the climate is taken. As will be discussed later, this is essentially the position of the United States. Others however argue that while it is true that climate change is a young science, many aspects of which are uncertain, this is no excuse for years of delay.[50] They point out that if humanity waits until detailed regional climate predictions are possible, it will be too late to avert disaster. The argument is that societies already invest in many areas, such as defense programs, to protect against uncertain but potentially dangerous threats. Investing in strategies to slow global warming is a "sort of insurance policy" against disasters that have far greater odds of occurring than most of the events for which insurance is usually bought.[51] The fact is that if nations delay actions in an elusive quest for scientific certainty, the risks and costs will mount unacceptably.[52]

The truth is that scientists cannot ever give the absolute definitive answers politicians and businessmen want in considering whether or not to take action on global climate change.[53] Remaining uncertainties on global warming should however render more, rather than less, cause for concern and immediate action.[54]

While scientific understanding of the greenhouse phenomenon is still incomplete, it does not mean that the international community should wait before moving towards a treaty that would respond to global climate change.[55] There is every need to address the question of

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[49]This is a summary of the IPCC Report contained in Simons, *Scientists Urging Gas Emission Cuts*, N.Y. Times, 5 November 1990, at A5. The bulk of these conclusions was confirmed by the IPCC last January 1992 although it scaled down its estimates of how much warming may actually occur. *See* Hunt, Estimates of Global Warming Scaled Down, *supra* note 22.

[50]Flavin, *supra* note 4, at 6-7.

[51]*Id.*

[52]INTERNATIONAL CONFERENCE ON GLOBAL WARMING AND CLIMATE CHANGE: PERSPECTIVES FROM DEVELOPING COUNTRIES, *supra* note 1, at 557-558.

[53]GREENHOUSE GLASNOST, *supra* note 13, at 285.

[54]Holley, *Global Warming: Construction and Enforcement of an International Accord*, 10 STAN. ENV'TL. L.J. 44, 45-46 (1991).

[55]A unique characteristic of the global climate change issue is the crucial linkage between science and policy. Because of the complexities involved and the many different areas in which action is required, there is no simple solution or technological quickfix. The problem will need to be aggregated and partial solutions sought - as exemplified in the 1987 Montreal Protocol on protection of the ozone layer. Since policy decisions will have

global climate change within the framework of international law as soon as possible. Today, human activity can disrupt the Earth's biosphere totally, either deliberately or unwittingly. Given that humanity have this extraordinary power, caution - including legally-binding constraint - is called for.[56] In the words of the UNEP Executive Director,

> It is now true that uncertainty is not a signal to advance; it is a signal to move prudently. Until the modern era, it could be argued that uncertainty was no obstacle to development. If one forest or one lake was destroyed, then there was always one more forest and one more lake. Now, however, we have the capacity to disrupt massively not only a few forests and lakes, but the entire biosphere. We have the capacity to destroy this world if we are not careful, and therefore we must be careful.[57]

The choice before the international community seems clear: "international society does not have the luxury of waiting for scientific certainty before it responds to the potential threat of global warming."[58] The demand on the world community is to 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.[59]

4. *Global Warming and Human Activity*

The largest sources of greenhouse gas emissions resulting from human activity is the use of fossil fuels for energy purposes.[60] Other major sources include the clearing of forested land for agriculture, industrial and consumer use of chlorofluorocarbons (CFCs), the growing of rice in flooded paddies, and the raising of domestic livestock.[61]

The most crucial of greenhouse gases relating to global warming has been identified as carbon dioxide which arises primarily from the burning of fossil fuels, the manufacture of cement, and changes in land use

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to take place under conditions of scientific uncertainty, the aim should be interim decision points for policy actions based on the best available scientific evidence and consensus. *See* INTERNATIONAL CONFERENCE ON GLOBAL WARMING AND CLIMATE CHANGE: PERSPECTIVES FROM DEVELOPING COUNTRIES, *supra* note 1, at 557-58.

[56]Tolba, *Heeding Nature's Tug: An Environmental Agenda For International Relations*, 14 THE FLETCHER FORUM 239, 245 (1990).

[57]*Id.*

[58]Zaelke and Cameron, *supra* note 33, at 251.

[59]*Id.*

[60]WORLD RESOURCES, *supra* note 23, at 4.

[61]*Id.*

through large-scale deforestation, including burning and clearing land for agricultural purposes. A large quantity of carbon dioxide has been released through human activities since the industrial revolution. Worldwide consumption of fossil fuels in the period 1860 to 1949 has released 51 billion metric tons of carbon. Moreover, fossil fuel use has, in the past four decades, accelerated to the extent that carbon dioxide emissions between 1950 and 1987 totalled an additional 130 billion metric tons.[62] Land use changes, on the other hand, released another 60 billion metric tons of carbon dioxide since 1860.[63] Thus, in the period 1860-1987, the release of carbon dioxide resulting from human activities has amounted to an estimated 241 billion metric tons of carbon.[64]

Carbon dioxide accounts for half of the warming potential attributable to human activity.[65] According to the World Resources Institute, an estimate of the contributions of the major greenhouse gases based on the atmospheric concentrations of the gases during the mid-1980s and their relative heat-trapping potential, yields the following picture: carbon dioxide, 50 percent; chlorofluorocarbons, 20 percent; methane, 16 percent; tropospheric ozone, 8 percent; nitrous oxide, 6 percent.[66]

Given the above picture, it can be concluded that the world energy system is responsible for more than half of the greenhouse effect, releasing not only 21 billion tons of carbon dioxide to the atmosphere annually but substantial quantities of two other important greenhouse gases as well - methane and nitrous oxide.[67] Since carbon-containing fossil fuels provide almost four-fifths of the world's energy, and their use continues to grow 3 percent annually, there is a clear demand to reverse this trend and move the world gradually away from its dependence on fossil fuels.[68]

Deforestation is likewise responsible for the global warming crisis. For example, it has been estimated that halving the rate of deforestation in just four countries - Brazil, Indonesia, Columbia, and

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[62] *Id.*, at 13-14.

[63] *Id.*

[64] *Id.*

[65] In 1988 alone, some 5.66 billion tons of carbon were produced by the combustion of fossil fuels - more than a ton for each human being. Another 1-2 billion tons were released by the felling and burning of forests, mainly in tropical areas. Each ton of carbon emitted into air results in 3.7 tons of carbon dioxide. Thus, at least 24 billion tons of carbon dioxide entered the atmosphere from these processes in 1988 alone. *See* Flavin, *supra* note 4, at 23.

[66] *Id.*

[67] *Id.*, at 7.

[68] *Id.*

Cote d'Ivoire - could cut total net carbon emissions from tropical forests by more than 20 percent.[69] Indeed, as one author has concluded: "stopping deforestation within their borders is by far the largest contribution that many developing countries can make to global climate stabilization, as well as to their own economic futures."[70]

These trends would be bad enough if emissions were holding steady, but they are growing exponentially as well - at 3 percent annually in the case of carbon. While it took 10 years for carbon emissions to go from 2 to 3 billion tons, it took just six years to go from 3 to 4 billion tons. This growth in carbon emissions has of course been fueled by other exponential growth rates - namely of population and economic output.[71]

5. *Countries Responsible*

The challenge posed by global warming is to international society's ability to confront a common threat. Complex equity issues arise because the contribution of individual countries to the problem varies widely, as do their stakes in a solution. In general, the industrial market countries are responsible for about 46 percent of the problem, the Soviet Union and Eastern Europe for 19 percent, and developing nations (with four-fifths of the world's population) for 35 percent.[72]

Despite the central role of the industrial countries in bringing on global warming, the contribution of the developing countries at present and in the future must not be underestimated. Today, twenty percent of the emissions of the principal greenhouse gas, carbon dioxide, results from fossil fuels used in developing countries. By the middle of the 21st century, this figure could reach over 50 percent.[73]

The United States is the most carbon intensive large country, at 5 tons per person. West Britain and Great Britain occupy the next rung, at about 3 tons per person, and Italy and France use even less, about 1.8 tons per person.[74] West Germany and Japan use less than half of that of the United States.[75] While the developing world is currently burning fossil

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[69]*Id.*, at 58-59.
[70]*Id.*
[71]*Id.*, at 23.
[72]*Id.*, at 8.
[73]INTERNATIONAL CONFERENCE ON GLOBAL WARMING AND CLIMATE CHANGE: PERSPECTIVES FROM DEVELOPING COUNTRIES, *supra* note 1, at 554.
[74]Flavin, *supra* note 4, at 25.
[75]GREENHOUSE GLASNOST, *supra* note 13, at 111.

fuels at far lower levels than in the industrial world, there is a wide disparity among countries. At the high end of the spectrum are Mexico and South Korea, which emit about 1 ton of carbon per person, about half the level in Western Europe. China, which produces 0.56 tons per capita and Brazil, with 0.38 tons, are also big contributors. In South Asia, emissions are lower at 0.19 tons per person in India and 0.16 tons per person in Indonesia. Most African countries, on the other hand, have emission rates under 0.10 ton.[76]

The actors in deforestation differ from that in the fossil fuel area. Most forests are in the developing world although multinational companies and governments of at least some of the developed countries are also frequently responsible for clearing forests.[77] In many developing countries, deforestation is adding far more carbon dioxide to the atmosphere than is fossil fuel combustion. Brazil, for example, is contributing an estimated 336 million tons of carbon to the atmosphere each year due to deforestation. This is over six times as much as through fuel combustion. As a consequence, Brazil ranks as the fourth largest carbon emitter in the world.[78] Other countries whose deforestation pushes them into the top global emitters include Indonesia and Columbia.[79]

While sources of greenhouse gases are distributed widely around the world, with both North and South sharing major responsibility for emissions, just five countries in 1987 alone -the United States (17.6%), the former U.S.S.R. (12%), Brazil (10.5%), China (6.6%) and India (3.9%)- contributed 50% of the warming potential added to the atmosphere that year.[80] Other major contributors that year included Japan (3.9%), the Federal Republic of Germany (2.8%), the United Kingdom (2.7%), Indonesia (2.4%) and France (2.4%).[81] In the Greenhouse Index prepared by the World Resources Institute, every major region of the world and every continent is represented in the top 50 countries and all except Africa are represented in the top 20. Such widespread responsibility clearly implies that any effective agreement to stabilize or reduce these emissions will have to be equally widely based.[82]

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[76]Flavin, *supra* note 4, at 27.

[77]Weiss, "*A Resource Management Approach to Carbon Dioxide During the Century of Transition*", in WORLD CLIMATE CHANGE, *supra* note 43, at 169, 183.

[78]Flavin, *supra* note 4, at 28.

[79]*Id.*

[80]WORLD RESOURCES, *supra* note 23, at 13-14.

[81]*Id.*, at 15.

[82]*Id.*, at 5-16.

To conclude, while most countries contribute to global warming, the volume of that contribution, and the attendant responsibility, is not equal. A few of the most industrialized states are responsible for the majority of the greenhouse gases, other rapidly industrializing states are adding considerably to the volume, while the small developing states produce negligible greenhouse gases. More importantly, the capacity to respond to global warming is not equal. The northern industrialized states have the technology, expertise, and financial means to minimize greenhouse gases as well as adapt to the consequences of warming, while many developing states have neither the technology, the expertise, nor the financial ability for such response.[83]

6. *Recapitulation: Characteristics of the Global Warming Crisis*

What makes the global warming crisis so difficult is that it is caused by many point sources of pollution and the pollutants emerge as by-products of the use of critical natural resources - the consumption of fossil fuels and the harvesting of forests and misuse of soil. This is compounded by the fact that the problem develops slowly with no immediate health or environmental effects, making it all the more difficult to convince decision-makers to take immediate action.[84]

Like most other international environmental problems, climate change is driven by the ethics of reproduction and consumption and is complicated by uncertainty and by two profound issues of equity: equity among generations, and equity with respect to developing nations and the world's poor.[85]

Some, for example, have observed that not everyone would lose even in some worst case scenarios. It is possible that Russia, particularly Siberia, would benefit with a more agriculturally conducive climate. Or as one scientist puts it: "If the corn belt simply moves north by several hundred kilometers, for example, Iowa's billion dollar loss could become Minnesota's billion dollar gain." The problem is how could the losers be compensated and the winners charged? This equity issue becomes more difficult if it spanned borders - if the release of greenhouse gases by the economic activities of one country or group of countries did

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[83]Zaelke and Cameron, *supra* note 33, at 284.

[84]Weiss, *supra* note 77, at 170.

[85]This is the observation of Daniel Magraw in *World Climate Change - Greenhouse Effect*, Proceedings of the 84'th Annual Meeting American Society of International Law 354 (1990).

disproportionate harm to other countries whose activities had contributed less to the build-up.[86]

It is also worth noting that the problem of global warming is intimately linked to other serious environmental problems involving the atmosphere, in particular those of acid rain, urban smog, and ozone depletion. These problems are linked in three ways: first, they are linked chemically because, once released, many of the pollutants that cause trouble interact in complex and synergistic ways within the atmosphere or play a role in more than one problem; second, they are also linked economically because it is often the same human activities that release the pollutants responsible for all three problems; finally, they are linked in a policy sense because policies designed to attack one problem - by modifying an economic activity to reduce emission of the pollutant responsible, for example - inevitably will affect other problems as well.[87]

Finally, global warming - with other new global environmental problems - has a new character. "The key aspect is the irrelevance of national boundaries to the problem."[88] The global effect of a billion metric tons of carbon dioxide is the same "whether it is released from a northern industrial country or a southern developing nation, whether it comes from burning coal in a power plant, gasoline in a car, or trees in a forest."[89] The prevention of atmospheric degradation is, therefore, a task that must be shared globally. Since we are transforming a planet, it is only as a global species - "pooling our knowledge and coordinating our actions and sharing what this planet has to offer" - that we could have any prospect of managing the planet's transformation.[90]

In conclusion, these environmental issues force on the international community "not just a transnational but also a trans-generational ethic."[91] The persons most affected by these problems are not the present but the future generations. As such, "these are not classical inter-state issues; they are transnational and intrahuman issues. The dominant reality about them is not inherent conflict of national interest; the dominant reality is a shared interest in resolving or at least managing the problem . . . The relevant mode of behavior with respect to these problems, therefore, is not competition but cooperation and collaboration - emphatically not because of inherent

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[86]GREENHOUSE GLASNOST, *supra* note 13, at 127-128.
[87]WORLD RESOURCES, *supra* note 23, at 25.
[88]GREENHOUSE GLASNOST, *supra* note 13, at 25.
[89]WORLD RESOURCES, *supra* note 23, at 2.
[90]GREENHOUSE GLASNOST, *supra* note 13, at 197.
[91]*Id.*, at 25.

good will and fellowship, but because when you get down to the nuts and bolts of it, there is no other practical way to cope with these real problems in this real world."[92]

III. THE INTERNATIONAL RESPONSE TO GLOBAL WARMING

To understand the legal decision process, it has been suggested that the following questions be asked: (1) "who are the relevant actors in the situation" (participants); (2) "what are their subjectivities, their identifications, expectations of past and future and their demands" (perspectives); (3) "where they are interacting" (situations); (4) "what resources are being brought to bear in the particular interaction in order to influence outcomes" (bases of power); (5) "how these resources are being manipulated, whether coercively or persuasively and whether at particular elite members or at broad audiences" (strategies); (6) "and finally, with what outcomes."[93] This section of the paper applies this "phase analysis"[94] to the ongoing global warming negotiations. Before focusing however on the participants in the process, it is important, to understand their particular responses, to first identify the policy options which, with respect to the global warming phenomenon, are available to the international community.

1. Policy Options Available

Scientists at the U.S. Environmental Protection Agency (EPA) estimate that in order to stabilize atmospheric concentrations of carbon dioxide at the current level, it would be necessary to cut emissions by 50-80 percent, taking it back to the level of the fifties. In June 1988, scientists and environmental policymakers, meeting in Toronto, offered a more modest goal: cutting carbon emissions by 20 percent by 2005. This would be enough to slow climate change but not stop it.[95] The consensus among those who want actions to be taken now is that an initial global goal should be to reduce CO2 emissions by approximately 20% of 1988 levels by the year 2005.[96] But how can this be achieved?

The responses of the world community to global warming can take several approaches. First, prevention strategies can be used to minimize the quantities of greenhouse gases being emitted. Second,

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[92]Wilson, *Global Climate, World Politics and National Security*, in WORLD CLIMATE CHANGE, *supra* note 43, at 71, 74.

[93]W. M. REISMAN AND A. SCHREIBER, JURISPRUDENCE 14 (1987).

[94]*Id.*

[95]Flavin, *supra* note 4, at 28.

[96]THE CHANGING ATMOSPHERE: IMPLICATIONS FOR GLOBAL SECURITY, *supra* note 39, at 521.

mitigation mechanism strategies can be employed to compensate for emissions that do occur. Third, strategies can be devised to help societies and nations adapt to changes in climate and their consequences.[97]

While mitigation and adaptation strategies should also be employed, prevention has been argued to deserve the highest priority. Preventing emission of greenhouse gases into the atmosphere not only delays global warming but also slows its advance and reduces its ultimate magnitude.[98] Such a strategy includes five elements: (a) increasing the efficiency of energy production and use; (b) switching from carbon-intensive fuels such as coal to hydrogen-intensive fuels such as natural gas, where possible; (c) encouraging the rapid development and use of solar and other carbon-free energy sources; (d) eliminating the production of most chlorofluorocarbons (CFCs) and developing the means to recapture those now in use; and (e) reducing the rate of deforestation.[99]

The crucial aspect of any workable prevention strategy is a plan to improve energy efficiency. Only such improved efficiency has the potential to get societies off the fossil fuel growth in the short term.[100] This is not impossible as shown by the combined impact of increased oil prices and energy policy changes which allowed Western Europe, North America, and Japan to reduce the energy intensity of their economies on average by 25 percent between 1973 and 1988.[101] This allowed some of the most carbon intensive countries to cut emissions while their economies continued to grow. China has also improved its energy efficiency during the past ten years - at a rapid 3.7% annual rate. Without these combined efficiency improvements, carbon emissions would likely be about 1.1 billion tons per year higher than it is today.[102]

Overall, it has been estimated that energy efficiency improvements worldwide between 1990 and 2010 could make a 3-billion ton difference in the annual amount being released to the atmosphere.[103] This would imply an annual rate of energy efficiency improvement of 3%, keeping fossil carbon emissions to 6 billion tons in 2010, rather than the 9 billion tons that would result if efficiency improved at only 1 percent a year.[104]

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[97]WORLD RESOURCES, *supra* note 23, at 24.
[98]*Id.*, at 25.
[99]*Id.*
[100]Flavin, *supra* note 4, at 7.
[101]*Id.*, at 24.
[102]*Id.*
[103]*Id.*, at 35.
[104]*Id.*

Aside from energy efficiency, alternative energy sources can also be developed. If not for safety concerns, nuclear power could be a viable option. Unfortunately, because of basic unresolved technological issues such as its vulnerability to accidents and its reliance on highly dangerous materials as well as vast cost escalations, the failure to develop long-term disposal sites for nuclear waste, and a decline in public acceptance because of the Three Mile island and Chernobyl accidents, nuclear power is not a realistic medium-term option for slowing global warming.[105] The better alternative - cheaper and safer - is the development of renewable energy sources such as wind, geothermal, biomass and solar power.[106]

Another policy option that has been identified is the imposition of a carbon tax that would allow market economies to consider the now uncounted global environmental damage that results from fossil fuel use. Such a tax would encourage individuals and companies to choose fuels based on their relative contribution to global warming.[107] Ideally, such carbon taxes should be agreed on internationally so that the additional costs do not hit different economies disproportionately. In turn, the revenues could be used to offset other taxes and to develop permanent and stable funding for improving energy efficiency and developing renewable energy sources. A portion of the funds could also be employed to help developing countries pay for reforestation and energy efficiency programs.[108]

Still another strategy of restoring the earth's carbon balance is to use forests and agricultural lands as a carbon sink. Living plants and their soils constantly accumulate carbon. There is no doubt that the world's biological systems have the potential to offset much of the carbon produced through the burning of fossil fuels.[109] This would require massive reforestation as well as drastic steps to reverse worldwide deforestation.[110]

Halting deforestation must be a top priority of the global community if global warming is to be contained. Twenty-five million acres of forests - about the size of Great Britain - are destroyed each year and such destruction contributes 10 to 20 percent of the greenhouse

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[105]*Id.*, at 36-38.
[106]*Id.*, at 39.
[107]*Id.*, at 53.
[108]*Id.*, at 54.
[109]*Id.*, at 56-57.
[110]Forty percent of the world's tropical rainforests and tropical deciduous forests have disappeared already, and the remainder is defiled at the rate of 110,000 square kilometers a year or 20 hectares a minute. *See* GREENHOUSE GLASNOST, *supra* note 13, at 199.

gases released into the atmosphere every year. While reforestation must also be accelerated, the protection of existing forests is more urgent. The loss of an acre of forests releases 52 tons of carbon, while a newly planted acre only sequesters .52 tons of carbon annually. This means it takes 100 years of growth to offset the damage of clearing the same area of forest.[111]

The implementation of preventive strategies will have no immediate apparent effect on global warming. Strategies effected today are designed to ameliorate future dire effects.[112] This is the reason why proposals for immediate action are controversial: while they often entail large immediate investments, they are really directed against future events whose details are far from certain. Moreover, responding to global warming will not be cheap. While admitting that exact estimates are elusive, Tolba warns that we are facing financial obligations that will run into the hundreds of billions of dollars.[113] The costs of improving energy efficiency, shifting to alternative fuels, reforestation, and other necessary measures could easily amount to hundreds of billions of dollars. One study has in fact estimated the necessary effort at a cost of $1.6 trillion during the next two decades.[114] Others however point out that it makes sense to take steps now that will yield "tie-in" benefits even if climatic changes do not materialize as forecast. Pursuing energy efficiency, prevention of forest destruction and preservation of biodiversity rich areas are examples of such a strategy.[115] Besides, delay may result in even more costly as well as dangerous and possibly irreversible consequences for the global environment.[116]

In contrast to preventive strategies, adaptation strategies adjust the environment or society's ways of using it to reduce the consequences of a changing climate. Many economists tend to favor adaptation, often with little or no attempt to anticipate damages or prevent climate change. They argue that the large uncertainties in climate projections make it unwise to spend large sums trying to avert outcomes that may never come about. Adaptation, in contrast to prevention, is cheap. The infrastructure that would have to be modified in the face of climate change - such as water-supply systems and coastal structures - will have to be replaced in any case before large climatic changes are expected to

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[111] *Id.*, at 199.

[112] Nanda, *supra* note 42, at 381.

[113] Tolba, *supra* note 56, at 245.

[114] Miller, Policy Responses to Global Warming, 14 S. ILL. U. L.J. 187, 193 (1990).

[115] GREENHOUSE GLASNOST, *supra* note 13, at 129.

[116] Nanda, *supra* note 42, at 381.

appear. The infrastructure can simply be rebuilt as needed to cope with the changes in the environment.[117]

There are, however, major difficulties with adaptive strategies. First, the precise effects of global warming in specific areas are difficult to predict accurately given the limitations of current global environmental models. Thus, the preparation of adaptive strategies will not be easy. Second, adaptive strategies will be difficult to implement because such strategies are certain to disrupt existing societal patterns, whether they call for the revision of patterns of civilization, for the removal of populations from low-lying areas, or for other options. Moreover, since weather patterns tend to change gradually, people are unlikely to be convinced of the necessity for dramatic efforts until after a catastrophe occurs. Third, many adaptive strategies are likely to be expensive, particularly for Third World countries.[118]

Finally, there is another option available to the international community: do nothing now other than research on global warming. The argument of those who advocate this position is that global warming remains an unproven danger, that the knowledge about global warming is still so uncertain and the costs of the above-described strategies are not, as yet, justifiable.

2. *Western Europe and Japan: Perspectives, Bases of Power, and Strategies*

It is clear that the first and largest response to global climate change should come from industrialized countries. Since they are historically responsible for most greenhouse gas emissions in this century and because they have the resources, the advanced industrial states - which include the United States, Western Europe and Japan - also have the primary responsibility for reducing fossil fuel emissions, methane emissions, and CFCs, and for committing major economic, technological, and political resources to this issue.[119] The mandate is clearly on these states to lead the way out of the global warming crisis, and up to a certain limit, they have acknowledged this responsibility. At the Paris Economic Summit in July 1989, for example, the seven major economic powers called for concerted action to address global warming although they were short on specifics.[120] The problem is that the G-7 states have not yet found a consensus on how to address the problem. While Western

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[117]GREENHOUSE GLASNOST, *supra* note 13, at 128.

[118]Nanda, *supra* note 42, at 380-381.

[119]Holley, *supra* note 54, at 54.

[120]PARIS ECONOMIC SUMMIT: ECONOMIC DECLARATION, reprinted in 28 I.L.M. 1292 (1989).

Europe and Japan appear to be ready to deal decisively with the problem and take such drastic steps as cutting carbon dioxide emissions up to a certain level, the United States continues to refuse to make such a commitment. Hence, the impasse.[121]

The divergence among industrial nations was manifested as early as November 1989 when environmental ministers from sixty-eight nations met at Noordwijk, the Netherlands, and issued a statement that said: "In the view of many industrialized nations, such stabilization of carbon dioxide emissions should be achieved as a first step at the latest by the year 2000."[122] This was actually a weaker statement than the one initially considered. Originally, the Conference wanted to call for setting a cap on carbon dioxide emissions by the year 2000 and cutting them by 20% five years later, but that position was opposed by the United States and Japan, with support from the Soviet Union.[123] Japan however, by November 1990, had changed its position and supported the mandatory cuts on emissions.[124] Only the United States, among the G-7 states, remain opposed to an agreement instituting mandatory cuts in emission rates.

At the Second World Climate Conference held in Geneva in November 1990, the European Economic Community (EC) called for immediate action to stabilize greenhouse gas emissions at current levels by the year 2000. The EC was joined by Japan, New Zealand and Australia in support of studies concluding that carbon dioxide emission reductions could be instituted at no extra cost to the overall economy.[125] The EC has already pledged to reduce carbon dioxide emissions in the year 2000 and beyond to the 1990 level.[126] Sweden has actually enacted legislation that requires a cap on emissions. The Prime Minister of Norway has likewise pledged that his country will stabilize its emissions by 2000 and the Dutch have stated a goal of reducing their emissions by 2% per year during the next three years.[127]

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[121]This section will focus on the response of Western Europe and Japan while the next section will discuss the U.S. response.

[122]THE NOORDWIJK DECLARATION ON ATMOSPHERIC POLLUTION AND CLIMATE CHANGE, quoted in Moomaw, *Assessing The Greenhouse Challenge*, 14 S. ILL. U. L.J. 169, 183 (1990).

[123]Moomaw, *supra* note 122.

[124]Holley, *supra* note 54, at 45.

[125]SECOND WORLD CLIMATE CONFERENCE, CONFERENCE STATEMENT, cited in Holley, *supra* note 54, at 45.

[126]Havemann, *EC Plans Energy Tax To Curb Emissions*, Los Angeles Times, 14 December 1991, at A16.

[127]Moomaw, *supra* note 122.

To show their seriousness over the whole issue, European environmental and energy ministers approved in principle on 14 December 1991 an energy tax designed to cut down on carbon dioxide emissions. Such a tax, although it would raise the average price of gasoline in Europe by 6% and of electricity by 14%, would lead to a reduction in greenhouse gas emissions.[128] The ministers also decided not to rely on the tax strategy alone. The EC Commission was instructed to look at ways to increase energy efficiency and conservation and the use of solar power and other energy sources that do not produce carbon dioxide.[129] Dutch Environmental Minister J. G. M. Alders said he hopes Europe's efforts will make the Bush administration think twice about its opposition to tough measures to curb carbon dioxide emissions in the United States.[130]

Calling on other international leaders to sign a treaty to combat global warming by June 1992, British Prime Minister John Major acknowledged that "environmental problems cannot be solved in isolation from each other nor can they be successfully solved by nations or regions acting on their own."[131] Major,[132] recognizing that the adoption of a global warming treaty was the most important challenge in the 1992 UNCED Summit, said that "the problems we face are global problems and they require a global response in which each nation plays its full part."[133] As to the current debate on global warming, Major concluded that he was convinced that "for all the remaining uncertainties, the science is sufficiently clear that we must now put in place an international framework that will allow us to address this most global of problems in an effective and systematic way."[134]

The G-7 states remain deadlocked up to today. In its London summit last year, the world's major industrial states recognized that the UN Conference on Environment and Development (UNCED) in June 1992

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[128]Havemann, *supra* note 126.

[129]*Id.*

[130]*Id.*

[131]Major Calls For World Treaty To Combat Global Warming, The Reuter Library Report (12 January 1992).

[132]Mrs. Margaret Thatcher, Major's predecessor, also called for decisive action against global warming, observing that "for centuries, mankind has worked on the assumption that we could pursue the goal of steady progress, without disturbing the fundamental equilibrium of the world's atmosphere and its living systems. In a very short space of time, that comfortable assumption has been shattered." *See* Peters, *An International Approach To The Greenhouse Effect: The Problem of Increased Atmospheric Carbon Dioxide Can Be Approached By An Innovative International Agreement*, 20 CAL. W. INT'L. L.J. 67, 88-89 (1990).

[133]Major Calls For World Treaty to Combat Global Warming, supra note 131.

[134]*Id.*

will be a landmark event and that it will mark the climax of many international environmental negotiations. In their Declaration, they then committed themselves to work for a successful Conference and to give the necessary political impetus to its preparation.[135] As to global warming, the G-7 said that their aim was to achieve an effective framework convention on climate change, containing appropriate commitments and addressing all sources and sinks for greenhouse gases.[136] The Declaration went on to state that:

> We will seek to expedite work on implementing protocols to reinforce the convention. All participants should be committed to design and implement concrete strategies to limit net emissions of greenhouse gases, with measures to facilitate adaptation. Significant actions by industrial countries will encourage the participation of developing and East European countries, which is essential to the negotiations.[137]

As it did in Houston a year earlier, the United States again prevented the group of seven industrialized nations from a commitment, during the London summit, to reduce carbon dioxide levels.[138] The aim to achieve an effective framework convention on climate change, committing all the participants to concrete strategies to limit net emissions of greenhouse gases, falls short of a commitment to reduce greenhouse gases which all other delegations had hoped to achieve at the London summit.[139] Dutch Prime Minister Rudd Lubbers, explaining the G-7 decision, said that the United States doubted the scientific data on carbon dioxide emissions and was unsure whether it was "such a serious problem" and that the United States was "really worried about the effects on the economy - the constraints if we move too fast."[140] Lubbers however made it clear that "most countries think that this has been proven sufficiently and at least that we shouldn't take the risk and go too far with carbon dioxide."[141]

The perspective then of Western Europe and Japan is to achieve a treaty by the time the UNCED convenes in Rio de Janeiro in June 1992. These states have chosen to work for an international agreement on global climate change on the basis of their perception that the problem is real and the risks are large. Implicit in their position is the

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[135]ECONOMIC DECLARATION OF THE G-7 LONDON SUMMIT, reprinted in BNA International Trade Daily, 26 June 1991.

[136]*Id.*

[137]*Id.*

[138]*U.S. Prevails On G-7 As Summit Concludes With No Commitment To Curb Carbon Dioxide*, BNA International Environment Daily, 18 July 1991.

[139]*Id.*

[140]*Id.*

[141]*Id.*

admission that they have a great responsibility for the problem and for the solutions that must be taken.

To influence the outcome of this decision process, Western Europe and Japan have taken steps to persuade the United States and the developing world to agree to the same measures that they are willing to take. Their strategies - directed at particular elite members in the world community (the United States) and at broad audiences (the developing world and the world community at large, particularly the environmental community) range from pressure tactics such as conferences and multilateral declarations to unilateral actions such as announced self-imposed mandatory cuts on emissions and carbon taxes. These strategies could work because included in this group are, with the exception of the United States and Russia, the most powerful - politically and economically - states in the world. In particular, it is the economic strength of these states which gives them their base of power, i.e. the resources needed in order to influence the outcomes in this particular interaction.

3. *The United States: Perspectives, Bases of Power, and Strategies*

The initial response of the United States to the global warming issue was cautious and open-ended. In 1987, Congress enacted the Global Climate Protection Act of 1987 (GCPA) which made the President responsible, through the EPA, "for developing and proposing to Congress a coordinated national policy on global climate change."[142] Under this Act, the Secretary of State was mandated to seek further international cooperation in limiting global climate change. The Secretary of State and the EPA administrator was also required to jointly submit, by the end of 1989, a report on international cooperative efforts.[143] The report was to analyse "international scientific understanding of the greenhouse effect" and "to assess the United States' efforts towards gaining international cooperation to limit global climate change."[144] Finally, the Act encouraged coordination of domestic and international climate activities.[145]

In enacting the GCPA, Congress identified four goals of U.S. policy:

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[142]Global Climate Protection Act of 1987, cited in Nanda, *supra* note 42, at 386.
[143]*Id.*
[144]*Id.*
[145]*Id.*

> "(1) increasing worldwide understanding of the greenhouse effect and its environmental and health effects, (2) fostering coordinated international scientific research efforts, (3) identifying technologies and activities to limit mankind's adverse effect on the global climate by (A) slowing the rate of increase of concentrations of greenhouse gases in the atmosphere in the near term, and (B) stabilizing or reducing atmospheric concentrations of greenhouse gases over the long term, and (4) working towards multilateral agreements."[146]

On Jan. 30, 1989, Secretary of State James Baker enumerated the basic elements of the United States' approach to global warming:

> The first is that we can probably not afford to wait until all of the uncertainties have been resolved before we do act. Time will not make the problem go away.
>
> The second is that while scientists refine the state of our knowledge, we should focus immediately on prudent steps that are already justified on grounds other than climate change. These include reducing CFC emissions, greater energy efficiency and reforestation.
>
> The third is that whatever global solutions to global climate change are considered, they should be as specific and cost-effective as they can possibly be.
>
> The fourth is that those solutions will be most effective if they transcend the great fault line of our times - the need to reconcile the transcendent requirements for both economic development and a safe environment.[147]

By 1991 however, the U.S. position had hardened to a "no action" policy.[148] R. Reinstein, chief negotiator for the U.S. in negotiations held in Geneva last year, rejected the idea of stabilizing

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[146]15 U.S.C. §2901; *see also* 10003(a) (1987), cited in Nanda, *supra* note 42, at 386.

[147]Baker, Remarks Before The Response Strategies Working Group, Intergovernmental Panel on Climate Change (Jan. 30, 1989), cited in Fitzgerald, *The Intergovernmental Panel on Climate Change: Taking the First Steps Towards a Global Response*, 14 S. ILL. U.L.J. 231, 239 (1990).

[148]John Sununu, former Chief of Staff of President Bush, was, by all accounts, the single individual most responsible for the United States taking a wait-and-see stance on global warming. For Sununu, the question was a straightforward one of economic growth versus an unproven environmental threat. On global warming, he said that the Administration had "a very strong commitment toward making sure we develop a superior understanding of the reality of global climate change" before making "either national or international decisions that are multi-trillion dollar decisions in in terms of impacts on the economy and jobs." *See Where Sununu Stands*, The New York Times, 10 September 1991, at C9. Environmentalists have expressed the hope that Sununu's departure will lead to change in policy. *See* Mathews, *Countdown to Earth Summit*, The Washington Post, 6 December 1991, at A31.

carbon dioxide emissions at 1990 levels by the year 2000.[149] Reinstein ignored criticism of the U.S. position from environmentalists and developing states, saying that these groups failed to comprehend the political, economic and energy challenges associated with stabilizing greenhouse gases in the United States. He said the energy strategy of the U.S. relied on use of its abundant coal reserves and that shifting to a cleaner source of energy would not only be expensive but it would fail to provide the United States with a high degree of energy security.[150] Reinstein called the proposals discussed in the Geneva meeting - which focused on energy conservation - "too interventionist" and "a potential violation of national sovereignty."[151]

The issue separating the United States from other countries in the climate-change debate is the treatment of carbon dioxide. The U.S. has maintained that it will not make any commitment to reduce or stabilize emissions of carbon dioxide at 1988 levels by 2000. Among developed industrial states, it stands alone in this regard. The present administration believes that more information is needed before the United States makes commitments that could cost billions of dollars.[152]

The reasons for the U.S. position are the scientific uncertainty concerning the greenhouse effect and the costs that are associated with the measures that have been proposed as required for the containment of global warming.

Some studies have suggested that the costs to implement projects to cut carbon emissions could have a crippling effect on the economy, and with only negligible benefit. From the point of view of the U.S., economics will clearly be the driving force behind any agreement on climate change. The United States will probably not agree to any proposal unless it can be shown that the agreement will not hurt its economy.[153]

In a recent study ordered by Congress, the U.S. Department of Energy concluded that reductions in carbon dioxide emissions similar to those adopted by several European countries would cost the U.S. as much as $95 billion a year, double the price of gasoline and increase the

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[149]Money, *U.S. Position Remain Barriers On Climate Change Issues*, BNA International Environment Daily, 27 September 1991.

[150]*Id.*

[151]Hunt, *Business And The Environment: Geneva Passes The Buck To Rio*, Financial Times, 4 September 1991, at 12.

[152]*See United Nations Meeting Tops International Agenda*, International Environment Daily, 17 January 1992, at 3.

[153]*Id.*

wellhead cost of natural gas by 400 percent.[154] The report also concluded that a $500-per-ton carbon tax would be necessary to reach the 20% reduction through reduction of fossil fuel use and that a 50% reduction would not be attained even with a carbon tax of $750 per ton on carbon emissions.[155] According to Energy Secretary James D. Watkins, these conclusions show that steps to stabilize carbon dioxide emissions at present levels by 2000, a position taken by the European Community, are premature. According to Watkins,

> this study points out the very high costs to our economy of the large carbon dioxide emission reductions some are advocating. Given these high costs, given the uncertain state of our knowledge about how greenhouse gases affect global climate change, and given the limited effect that action by any one nation can have on global greenhouse gas emissions, arbitrary emission reduction targets such as those studied here are clearly unwarranted.[156]

The official U.S. position is echoed by U.S. business groups. In its 1988 White Paper, the American Petroleum Institute observed that "the greenhouse problem is poorly understood," that many scientists are "unsure that the greenhouse effect has started and uncertain of the magnitude of the consequences, if any, that may follow if and when it does begin." Thus, according to the White Paper, the nation must proceed cautiously in resolving the issue.[157]

Thomas G. Landrix, Chairman of the Global Climate Coalition, an organization representing a broad spectrum of U.S. companies and trade organizations dealing in energy production and consumption, argues that while there is no disagreement over the greenhouse theory itself and the conclusion that atmospheric accumulations of greenhouse gases are increasing, there are differing views over the significance of future greenhouse gas emissions and what should be done about these emissions now.[158] Landrix also observed that little public scrutiny has so far been devoted to what it might mean to adjust lifestyles and otherwise pay for corrective measures in the U.S. and around the world to address global climate change.[159] Thus, for U.S. business groups, intensified scientific research should be the first priority, that

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[154]Abramson, *Greenhouse Gas Curbs Costly, U.S. Study Finds*, Los Angeles Times, 6 December 1991, at A30.

[155]*Id.*

[156]*Id.*

[157]Yate, *Global Warming: A New Priority*, Public Utilities Fortnightly, 2 February 1989.

[158]GREENHOUSE GLASNOST, *supra* note 13, at 54.

[159]*Id.*, at 52.

significant resources should be focused on reducing as much of the scientific uncertainty as possible over the next 10 to twenty years.[160]

Others have however argued that the argument against action based on costs is exaggerated. They point to the too little appreciated fact that over the past fifteen years, investments in improving the efficiency of America's buildings, appliances, vehicles, industrial equipment, and other energy-consuming devices have cut energy consumption by one-third, reduced carbon dioxide, and sulphur and nitrogen oxide pollutants to 50 percent below what they could have been, and trimmed the U.S. energy bill by $160 billion per year.[161] Representative Claudine Schneider, author of the Global Warming Prevention Act, now pending in the U.S. House of Representatives, says that detailed government and private studies show the U.S. economy could maintain its robust economic growth while achieving $200 billion per year in energy savings through continued investment in efficiency technologies.[162] She observes that the United States currently requires twice the energy to produce a dollar of Gross National Product than other countries such as Japan and many West European nations require.[163]

The lack of U.S. initiative and leadership on reducing emissions of carbon dioxide is, according to environmentalists, already creating a disastrous chain reaction. Other industrialized countries - such as the U.K., Japan and France - feel less motivated to make their own reductions and are even floundering on their previous commitments to do so because the U.S. - as the world's largest source of fossil fuel CO2 emissions - refuses to set any kind of targets and timetables for their reduction. Developing countries, on the other hand, see no reason to curb their alarming rates of deforestation - the second major source of CO2 emissions - as long as the developed nations are not taking decisive action to address the problem of their own emissions.[164] The U.S. has also been criticized for "selfishly pursuing its strategy in the face of an environmental and human tragedy."[165]

Without Britain or Japan in its corner, the United States' principal allies in resisting greenhouse commitments in the broader global negotiations are Saudi Arabia, the Peoples' Republic of China

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[160]*Id.*, at 55.
[161]*Id.*, at 69.
[162]*Id.*, at 69.
[163]*Id.*
[164]Environmental Defense Fund, *Climate Change: The U.S. In The Role Of Environmental Villain*, U.S. Newswire, 15 July 1991.
[165]Money, *U.S. Position Remain Barriers On Climate Change Issues*, BNA International Environment Daily, 27 September 1991.

and the former Soviet Union. Saudi Arabia and other oil-producing countries obviously would be against any plan that might lower consumption of their major product. On the other hand, the former Soviet Union cannot cope with additional requirements of any kind, though improved energy efficiency would greatly benefit its economy. The question is how long the United States can resist the international pressure to change its position. Already, there are signs that the U.S. is about to make a significant shift in its position. This change of position may come as early as this February when the global climate change negotiations resume in New York.[166]

To summarize, the perspective of the United States is not to take the drastic measures that are said to be necessary to contain global warming. Instead, the U.S. maintains that additional scientific research must be undertaken before the international community implements such steps as mandatory cuts on emissions. The reason for the position is basically economic - the changes that such steps would require in the business and lifestyle of U.S. society. Hence, the strategies that the U.S. has employed to defend its perspective is to deny the certainty of the feared consequences of global warming and to point at the great costs of the proposed measures. The strategy is not so much intended to influence elite members such as Western Europe and Japan but it is directed more to affect the opinion of internal constituencies -U.S. business in particular and the U.S. public in general. The strategy is also directed towards developing states, many of which are also reluctant to enter into a global climate agreement.

Obviously, the U.S. position commands attention from all the other participants in the decision process. The bases of power of the United States cannot after all be denied: it is the most powerful state politically, militarily and (arguably) economically and it ranks first in emissions. Hence, participation by the U.S. is indispensable for any international regime on climate change to work.[167]

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[166]Stevens, *Washington Odd Man Out, May Shift On Climate*, The New York Times, 18 February 1992, at C1.

[167]It has been pointed out that while the inclusion of extraneous players or issues can easily derail efforts to form effective regimes, the exclusion of relevant players or issues can result in the establishment of regimes that soon become dead letters. *See* O. YOUNG, G. DEMKO, & K. RAMAKRISHNA, GLOBAL ENVIRONMENTAL CHANGE AND INTERNATIONAL GOVERNANCE 10 (1991). Obviously the exclusion of the U.S. from a global climate change convention would render any international regime provided therein inutile.

4. *The Developing States: Perspectives, Bases of Power, and Strategies*

The regional asymmetry of the global warming phenomenon makes the problem more complex than any other international environmental problem. While most of the past and current emissions of greenhouse gases have come from the highly industrialized nations, it is likely that many of the most serious effects of global climate change will occur in the developing countries. Developing countries are also far more dependent on natural resources and natural systems than are industrialized nations and lack the financial and technical resources to make the expensive and difficult changes that adapting to temperature increases would demand.[168] Among the developing states, it is the low-lying coastal and island states that 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.[169]

On the other hand, many developing countries, in opposing regulations relative to planned and inadvertent climate modification, fear that such restrictions will make it impossible for them to develop to the same level as developed countries.[170] Many developing countries do not fully trust the industrialized nations and see atmospheric pollution as a product of carefree and careless misuse of natural resources by the developed world. According to this view, developing countries, are being asked to make sacrifices to support the materialistic values of the developed world.[171] While these countries freely acknowledge that they make a small but increasing contribution to greenhouse gas pollution by consuming fossil fuel and clearing tropical rainforests, they point out that the bulk of greenhouse gases still comes from the north. They lament the fact that:

> now that the poor South stands poised to exploit its own resources and mineral reserves for its own progress rather than to feed the mills and factories of its former colonial masters, now that there is hope that native industrialization holds the key to escaping the shackles of

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[168]Holley, *supra* note 54, at 53.

[169]Zaelke and Cameron, *supra* note 33, at 253.

[170]Sherk, *Unilateral Actions to Control Planned and Inadvertent Climate Modifications: Options and Obstacles*, WORLD CLIMATE CHANGE, *supra* note 43, at 128.

[171]Usher, *Climate Change and The Developing World*, 14 S. ILL. U.L.J. 257, 260-61 (1990).

> environmental disadvantage, the already rich countries seem to be saying, "stop what you are doing in the name of the global good."[172]

Given these contradictory attitudes towards global warming, the perspective of developing countries can be best summarized in these two declarations:

> The 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 issue 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 condition of their citizens.[173]

> When resources are inadequate for mounting programmes both for needed development of the poor and achieving globally desirable reduction of greenhouse gas emissions, developed countries should be asked to contribute the difference. Climate protection should be seen as a challenge to be met in partnership with the development assistance community and the industrial countries and not simply as another problem for the developing world. Having caused the major share of the problem and possessing the resources to do something about it, the industrial countries have a special responsibility to assist the developing countries in finding and financing appropriate responses.
>
> The developing countries' contribution in response to the greenhouse challenge should be carried out in a way that enhances, rather than diminishes, development prospects. Where these are in conflict, priority should be given to development, which brings so many clear and needed benefits, particularly for the poorest 60% of the population in developing countries. Only in this way can these populations be brought to the minimal level of health and resilience needed to cope with environmental stress and stabilize population sizes.[174]

These texts reveal the position of developing states as follows: they are willing to make commitments to cut greenhouse gas emissions but not at the expense of their economic development and the North must shoulder most of the costs. Thus, in the Geneva negotiations last year, developing states maintained that since the industrialized countries

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[172]*Id.*

[173]THE CHANGING ATMOSPHERE: IMPLICATIONS FOR GLOBAL SECURITY, *supra* note 39, at 519.

[174]INTERNATIONAL CONFERENCE ON GLOBAL WARMING AND CLIMATE CHANGE: PERSPECTIVES FROM DEVELOPING COUNTRIES, *supra* note 1, at 554.

have been the main polluters, they should help the Third World pay for the cost of cleaning its environment.[175]

Any global climate treaty to reduce greenhouse gas emissions will have to include funding from industrialized countries for energy development and reduction of deforestation in poorer nations. Providing such funding will also serve the interest of developed states because such development would ease the pressure on the latter to reduce their own industrial emissions.[176] Thus, the issue of global climate warming offers an opportunity for advancing the "new economic order" of Third World nations since international action will require both technological and economic assistance to such nations if they are to participate in the global effort to reduce greenhouse gas emissions or arrest deforestation.[177] It would "border on the hypocritical" to ask developing countries to forego their economic development in the interest of ameliorating global environmental conditions that the developed world considers to be of utmost importance.[178]

The global warming crisis also provides for another unique opportunity for developing states. Because developing nations have not already sunk substantial capital into fossil fuel based energy production, they have an opportunity to successfully compete with industrialized nations by building economies based largely on nonfossil energy systems.[179]

In spite of the importance of the issue, many developing states are not yet participating in the preparatory work for a framework convention on global climate change. In the first meeting of the Intergovernmental Panel on Climate Change (IPCC), the majority of the states represented were from the developed world.[180] This is a manifestation of a central problem in the international process for addressing climate change: how to actively involve the developing world in the international process for a full assessment of the problem to

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[175]Hunt, *Business And The Environment: Geneva Passes The Buck To Rio*, Financial Times, 4 September 1991, at 12.

[176]Holley, *supra* note 54, at 57-58.

[177]This is a comment made by R. White, *supra* note 85, at 353.

[178]*Id.*

[179]Holley, *supra* note 54, at 58-59.

[180]The exception to this are those coastal and island states that will directly be affected by global warming. As early as 1989, these states already called for a continuing dialogue between the small States and the rest of the world on the issue of sea level rise. They noted that the likely effects of sea level rise must be established more accurately and that an effective international strategy for the small States of the world to cope with these impacts should be agreed upon as a separate issue within a global strategy. *See* MALE DECLARATION ON GLOBAL WARMING AND SEA LEVEL RISE: SMALL STATES CONFERENCE ON SEA LEVEL RISE, *supra* note 34, at 602.

be achievable and for effective response strategies to be developed.[181] The head of UNEP has noted that "in many developing countries there is 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."[182] What is required is assistance to developing states to help them prepare their response so that they can meaningfully participate in the international response to global warming.[183]

In recent months however, the developing states have become more involved in the process. In a conference held in Geneva last December 19, 1991, it was reported that 43 developing nations, including India, China and Brazil, broke ranks with the "G-7" umbrella group by issuing their own proposals for the wording of global climate agreement.[184] Another group, the 35 strong Alliance of Small Island States (AOSIS) whose countries are most threatened by global warming, had already presented its more radical proposals. Environmentalists saw the split as positive, observing that the South finally appeared willing to negotiate on the question of global warming and that the split also raised the possibility of the first North-South alliance of nations pressing for an effective climate change convention.[185]

To summarize, the perspective of developing states is that they are willing to enter into an international agreement on global warming, including accepting such measures as mandatory emission cuts. However, this should not be at the expense of their economic development and under the condition that the North bear most of the costs and commit to provide assistance to developing states. To influence the outcome of the global warming negotiations, these states, with the exception of the small island and coastal states, have pursued the strategy of persuasion and coercion (by threatening not to be involved in the process) directed against the elite members of the world community. And they have met relative success because, notwithstanding their poverty and political weakness, the developing states are major actors in this particular decision process. After all, they do contribute a significant amount of atmospheric pollution and this contribution is expected to grow exponentially in the next few decades.

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[181]Fitzgerald, *The Intergovernmental Panel on Climate Change: Taking the First Steps Towards a Global Response*, 14 S. ILL. U.L.J. 231, 235-36 (1990).

[182]Zaelke and Cameron, *supra* note 33, at 281.

[183]*Id.*, at 282.

[184]Naughton, *Greenhouse Gas Talks Split Developing Nations*, The Reuter Library Report, 19 December 1991.

[185]*Id.*

5. *Intergovernmental Institutions: Perspectives, Bases of Power, and Strategies*

The General Assembly of the United Nations, in a Resolution dated 27 January 1989, recognized that "climate change is a common concern of mankind since climate is an essential condition which sustains life on earth."[186] The Resolution also urged governments, intergovernmental and non-governmental organizations, and scientific institutions to treat climate change as a priority issue.[187]

Resolution 43/53 specifically requested that the Secretary-General of the World Meteorological Organization and the Executive Director of the UNEP work through the IPCC to develop a comprehensive review and recommendations with respect to:

> (a) The state of knowledge of the science of climate and climatic change;
>
> (b) Programmes and studies on the social and economic impact of climate change, including global warming;
>
> (c) Possible response strategies to delay, limit or mitigate the impact of adverse climate change;
>
> (d) The identification and possible strengthening of relevant existing international legal instruments having a bearing on climate; and
>
> (e) Elements for inclusion in a possible future international convention on climate.[188]

Right now, the most important forum for international dialogue on global warming is the Intergovernmental Panel on Climate Change formed in 1988 by the UNEP and the World Meteorological Organization. The IPCC has been mandated to give all countries a current scientific reading of the greenhouse problem, assess policy responses to it, and propose a convention or other legal mechanism for reducing greenhouse gas emissions.[189] It was established to accomplish two main objectives: (1) to assess the scientific understanding of climate

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[186]PROTECTION OF GLOBAL CLIMATE FOR PRESENT AND FUTURE GENERATIONS OF MANKIND, Resolution by the United Nations General Assembly (27 January 1989: A/RES/43/53, Forty-Third session, Agenda item 148) in SELECTED MATERIALS, *supra* note 1, at 526.

[187]*Id.*

[188]*Id.*

[189]*See* Lyman, *supra* note 18, at 103-104.

change; and (2) to formulate realistic response strategies for national and global action.[190]

The IPCC divided its work among three working groups, with each group preparing a report that will be combined into the IPCC's final report. Working Group I, chaired by the United Kingdom, is responsible for the assessment of available scientific information on climate change. Working Group II, chaired by the former USSR, is responsible for assessing the potential environmental and socio-economic impacts of climate change. Working Group III, chaired by the United States, is responsible for formulating possible strategies for responding to climate change.[191] The IPCC issued its first report on November 1990 and followed this up with another report last January, 1992.[192]

Other intergovernmental institutions that are and will play a significant role in the response of the world community to global climate change are the World Bank, regional development banks, and other development assistance agencies. These institutions will need to evaluate their policies in light of the impending global warming. In particular, developing countries will need assistance in the transition phase from traditional fossil fuels to more appropriate energy forms, and in promoting the preservation of forests and reforestation.[193] They can also play a role by using climate protection as a consideration in reviewing loans.[194]

The perspective then of most intergovernmental institutions is to formulate a comprehensive response to the problem of global climate change as early as possible. The strategies - directed not only to states but to the international community at large - range from calls of action to doing the basic scientific research necessary for understanding the problem and possible solutions. So far, it appears that such strategy is working. This success is explained by the base of power of intergovernmental institutions: they are the main fora in which issues such as global warming can be addressed by the world community and therefore, they cannot be ignored.

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[190]Fitzgerald, *supra* note 181, at 233-34.

[191]*Id.*, at 237.

[192]*See* note 49.

[193]INTERNATIONAL CONFERENCE ON GLOBAL WARMING AND CLIMATE CHANGE: PERSPECTIVES FROM DEVELOPING COUNTRIES, *supra* note 1.

[194]Flavin, *supra* note 4, at 71.

6. *Non-Governmental Organizations: Perspectives, Bases of Power, and Strategies*

In recent years, it has become clear that efforts to bring public pressure to bear on decision-makers play a crucial role in the political interplay surrounding the effectiveness of international environmental regimes. Non-governmental organizations (NGOs) now loom large not only in the processes of regime formation but also "in catalyzing and aggregating public pressure on officials to live up to the commitments they make in accepting the terms of environmental regimes."[195] Thus, the environmental movement, traditionally focused almost exclusively on internal concerns, has become a force to be reckoned with in the political dynamics surrounding international environmental governance.[196]

Non-governmental organizations (NGOs) such as Greenpeace International, Friends of the Earth, and World Wide Fund for Nature have been involved "in identifying threats to the environment, in attempting to force governments to take measures to protect the environment, and in signalling breaches of existing international environmental regulations."[197] These NGOs have come to be "the primary source of expression for the international desire to protect the environment, and number among its most effective guardians."[198]

This is no less true in the global warming issue and in the ongoing international debate and negotiations. The environmental NGOs - international and domestic - were among the first to confront the issue[199] and today continue to push governments to make the necessary decisions. Among others, NGOs have been very vocal in their criticism of the United States position on global warming.[200]

In recognition of the significant role of NGOs, the U.N. Secretary-General had specifically requested "the active involvement

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[195]YOUNG, DEMKO, & RAMAKRISHNA, *supra* note 167, 4 at 12-13.

[196]*Id.*

[197]Sands, *The Environment, Community and International Law*, 30 HARV. INT'L. L.J. 393, 394 (1989).

[198]*Id.*

[199]At an August 1989 National Energy Strategy hearing conducted by the U.S. Secretary of Energy, only three of twelve witnesses suggested that global warming be seriously considered. Those three represented the World Resources Institute, the Sierra Club, and the Worldwatch Institute. The other nine witnesses, from the oil and coal industries, utility companies, and state regulators, largely ignored the threat of climate change. *See* Flavin, *supra* note 4, at 31.

[200]*See* notes 165 and 166.

of the NGO community" - environment and development groups and such constituencies as industry, trade unions, scientists, educators, indigenous peoples, and women's and youth organizations - in the preparation for the 1992 UNCED Conference, calling them "essential for its success."[201]

In conclusion, non-governmental organizations have been very effective in making known their perspective that immediate action must be taken to combat global warming. Using strategies of persuasion and coercion (pressure tactics), environmental organizations have been instrumental in forcing governments to take positions sooner than they might have done so if the NGOs were not around. They have been effective because of their base of power: their ability, using media and other more direct means, to mobilize and direct popular opinion in domestic societies as well as in the international community.

7. *Situations: The State of International Negotiations*

As early as June 27-30, 1988, an international conference, held in Toronto, attended by more than 300 scientists and policy makers from 48 countries, called upon governments, the United Nations and its specialized agencies, industry, educational institutions, NGOs and individuals to take specific actions to reduce the impending crisis caused by pollution of the atmosphere. The participants in the Toronto Conference recognized that no country can tackle this problem in isolation and that international cooperation in the management and monitoring of, and research on, this shared resource is essential.[202] The Conference called upon states to work with urgency towards an Action Plan for the Protection of the Atmosphere which should include an international framework convention while encouraging other standard-setting agreements along the way, as well as national legislation to provide for protection of the global atmosphere. It also called upon the international community to establish a World Atmosphere Fund financed in part by a levy on the fossil fuel consumption of industrialized countries to mobilize a substantial part of the resources needed for these measures.[203]

Five months later, international negotiations on global climate change began when representatives of 30 states met in Geneva, Switzerland, under the invitation of the United Nations Environment Program (UNEP) and the World Meteorological Organization. These

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[201] J. TESSITORE & S. WOOLFSON (EDS.), ISSUES BEFORE THE 45'TH GENERAL ASSEMBLY OF THE UNITED NATIONS 105 (1991).

[202] THE CHANGING ATMOSPHERE: IMPLICATIONS FOR GLOBAL SECURITY, *supra* note 39, at 515.

[203] *Id.*, at 515-516.

nations then formed the Intergovernmental Panel on Climate Change that was tasked to study global warming and make recommendations. A year later, in 1989, a Ministerial Conference on Atmospheric Pollution and Climate Change, attended by 70 governmental delegations, was convened. The proposal that gained favor in those early discussions was an initiative calling for industrialized nations to freeze carbon emissions at 1988 levels by 2005. While there was general support for this idea, it did not become a part of the conference's final declaration as four economic superpowers, the United States, the U.S.S.R., the United Kingdom, and Japan, refused to agree to such a restriction.[204] Since then, the United Kingdom and Japan have changed their position, accepting the call for a freeze.

Since 1989, the IPCC has issued two reports, both of which affirm the need to take immediate steps to reverse global warming.[205] In the meantime, the negotiations among states have shifted to the Intergovernmental Negotiating Committee on Climate Change (INCC) which, after three other conferences in the last two years, will resume discussions on a climate change treaty on Feb. 18, 1992 at the U.N. Headquarters in New York. The New York session is considered the most important and high-profile session to date and the goal is to agree on a treaty that can be signed during the Rio Conference.

What are the elements of the proposed global climate change treaty being discussed in the negotiations?

The major issue in the negotiations is the demand for a commitment to stabilize atmospheric concentrations of greenhouse gases by the middle of the 21st century, which implies reducing net carbon emissions to a maximum of 2 billion tons per year. To get there, the world will need to reduce global carbon emissions by 10-20 percent by the year 2000 and to end the production of CFCs by then. Negotiators will have to consider the adoption of a set of stricter goals to begin in 2000.[206] The question is how the international community can mandate these reductions and, assuming all major actors agree, how to monitor and enforce compliance.[207]

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[204]See GREENHOUSE GLASNOST, *supra* note 13, at 111.

[205]*See* note 49.

[206]Flavin, *supra* note 4, at 71.

[207]One politically crucial question is whether a treaty will propose basing future emissions reductions on past contributions, on current economic activities, or on estimates of future emissions. If emissions are reduced by a fixed percentage, countries, like Japan, which have already achieved relatively low levels of per capita emissions, will seek credit for gains already made. If future reductions are based on the level of cumulative emissions in the past, the U.S. is likely to object. See Lyman, *supra* note 18, at 104.

It has been suggested that a global climate treaty will have to be implemented in at least two stages, which would be ten to fifteen years apart. Phase I would be an interim phase which would allow countries with varying trade practices and laws to make the necessary adjustments to meet stricter requirements in Phase II.[208] The first stage of the agreement would constitute more traditional strategies of past international accords, which include requiring parties to install legislation to reduce emissions, provide for a global climate fund, as well as establish institutions to implement and coordinate its provisions.[209] The second stage of the treaty would provide for the implementation of strict command and control strategies, instituting intergovernmental monitoring and penalty provisions based on strict liability criteria. At this point, a mechanism for transcending national sovereignty might be necessary - a difficult and sensitive area, particularly among states of unequal bargaining power.[210]

To accomplish these goals, the UNEP would need to be made into a much more powerful U.N. agency, if it is to be given the mandate of coordinating research, and reviewing and assisting with national climate projection strategies.[211] As with arms control, verification is essential for a credible agreement. A strengthened U.N. agency would also manage a fund, created with the revenue from a carbon tax, that would help developing countries fulfill commitments to reduce carbon emissions.[212]

Others have called for a new or reformulated international organization within the U.N. system as essential if credible efforts are to be mounted. The Hague Declaration of 1989, for example, calls for the creation of a strong new international institution with enforcement powers to carry out the provisions of a global warming agreement. The Declaration noted the need for

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[208]Holley, *supra* note 54, at 82.

[209]*Id.*, at 82-83.

[210]*Id.*, at 87.

[211]Flavin, *supra* note 4, at 72-73.

[212]A climate change convention should provide that states shall consider the possibility of establishing a World Climate Trust Fund for use in initiating and supporting all necessary activities to reduce emissions of greenhouse gases and to mitigate effects of climate change. Programs to improve energy sufficiency, manage forests, plant trees, slow population growth, develop renewable energy sources, and design CFC substitutes would be eligible for such support. The Trust Fund could be funded from three possible sources: contributions by countries (voluntary or assessed), "user fees" for activities causing climate change, and fines for violations of the convention. See PROTECTION OF THE ATMOSPHERE; STATEMENT OF THE MEETING OF LEGAL AND POLICY EXPERTS, Ottawa, Ontario, Canada (22 February 1989) in SELECTED MATERIALS, *supra* note 1, at 541.

> 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 . . .[213]

The Hague Declaration also said that this institutional authority should "undertake or commission the necessary studies, be granted appropriate information upon request, ensure the circulation and exchange of scientific and technological information - including facilitation of access to the technology needed, develop instruments and define standards to enhance or guarantee the protection of the atmosphere and monitor compliance" of such standards.[214] Lastly, it recognized the need for appropriate measures to promote the effective implementation of, and compliance with, the decisions of the new institutional authority, decisions which will be subject to control by the International Court of Justice.[215]

It is true that the burden of proof should always lie with those who propose the creation of new organizations to administer international regimes but there is little doubt that the governance system to respond to global warming will require sophisticated institutional arrangements. Its tasks will include (1) managing a compensation fund, (2) administering programs featuring technology transfers, training, and additional development assistance, (3) compiling and updating the greenhouse index, and (4) assessing energy arguments for and against international actions to achieve additional reductions in aggregate greenhouse gas emissions. The case therefore for a new institution is strong.[216]

It has also been suggested that a global climate change treaty would require effective punitive provisions. Although penalties for environmental violations have usually taken the form of compensation by one country to another for harms done to that country, this cannot apply to global warming. Because global warming does not produce immediate identifiable harm to any one country, it is hard to formulate any form of penalty other than a penalty - adjusted according to a country's economic strength or Gross National Product - that goes to a

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[213]TEXT OF THE DECLARATION OF THE HAGUE, 11 March 1989 reprinted in 30 HARV. INT'L. L.J. 417 (1989).

[214]*Id.*

[215]*Id.*

[216]YOUNG, DEMKO, & RAMAKRISHNA, *supra* note 167, at 28.

central fund. Because of the severity of global warming in terms of its potential disastrous consequences, breaches of an international global warming agreement should be seen as an international crime to be severely penalized.[217]

Finally, some environmentalists look beyond the narrow definition of the global warming issue as one of fixing carbon emissions and recognize it as one more manifestation of encroachments on Earth's atmosphere. Instead of reacting to each manifestation of the problem on an ad hoc basis with a separate specific treaty, these advocates say that what is really needed is an international framework agreement for protection of the atmosphere against any kind of threat.[218] They argue that within such a framework, the world community does not need to wait for years as dangers emerge while major countries decide "whether they want to discuss the problem, dither over what more scientific evidence they need before agreeing on a plan of action, haggle over a structure as well as the program, and then fitfully implement the agreement."[219] Any kind of atmospheric pollution would fall within the scope of a broad international "Law of the Atmosphere".[220]

However, others maintain that the need is to build regimes on the best available scientific understanding of the problem to be solved and build in as much flexibility as possible to allow for adjustments in response to changing information, insights, and conceptualizations of the problem.[221] Because profound uncertainties and rapid advances resulting from ongoing research characterize the science of climate change, any international regime in this area must seek not only to stimulate the growth of knowledge but also to provide mechanisms for integrating new insights into the system without triggering a time-consuming and highly politicized ratification process.[222] And since the "legislative process" in the world community is cumbersome, what is required are procedures for adapting arrangements to new information and insights that avoid the complications associated with formal mechanisms.[223]

Having identified the necessary elements of a global climate change treaty and given the opposition of such major actors as the

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[217]Holley, *supra* note 54, at 90-91.

[218]J. LAURENTI & F. LYMAN, ONE EARTH, MANY NATIONS: THE INTERNATIONAL SYSTEM AND PROBLEMS OF THE GLOBAL ENVIRONMENT 16-17 (1990).

[219]*Id.*

[220]*Id.*

[221]YOUNG, DEMKO, & RAMAKRISHNA, *supra* note 167, at 15.

[222]*Id.*, at 22.

[223]*Id.*

United States and the former USSR,[224] the question that must now be addressed is whether it is realistic to hope that the world community can agree to such a treaty.[225]

8. The Analogy of Ozone Depletion

To answer the question on whether the international community can agree on a global climate change regime, it is necessary to look at how the same community has dealt with a similar issue: ozone depletion.[226]

Global warming was not the problem that first drew popular attention to the atmosphere's condition. It was the thinning of the ozone layer in Earth's upper atmosphere. Like global warming, ozone loss is not fully understood but scientists believe that CFCs are the primary contributor. The ozone layer, extending from about 18 to 30 miles above the earth, shields the planet from the sun's ultraviolet rays, which can be harmful to many forms of life. In human beings, for example, damages from ozone depletion can range from skin cancers to immune diseases to eye cataracts.[227]

The Montreal Protocol on Substances that Deplete the Ozone Layer is the landmark international environmental accord that was negotiated, entered into force, and amended in record time in response to scientific information on damage to the ozone layer by synthetic chemicals: chlorofluorocarbons (CFCs). The original agreement - called the Vienna Ozone Treaty - was signed in 1987 by 24 nations, later ratified by 52 nations.[228] A revised version was agreed upon and signed by 93 nations on June 29, 1990. The Protocol requires parties to restrict

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[224]As of this date, there is no indication what position the newly independent states of the former Soviet Union would take with regards to global warming. But given the enormity of their economic problems, it can be expected that they would be reluctant to make commitments that would have a substantial effect on their energy and industrial capacities.

[225]Stephen Schneider, in responding to pessimism about the prospects for an international initiative of this scale, comments that ". . . not long ago a massive disengagement of NATO and Warsaw Pact forces in Europe also seemed inconceivable. Perhaps the resources such an agreement would free and the model of international cooperation it would provide could open the way to a world in which the greenhouse century exists only in the microchips of a computer." *See* GREENHOUSE GLASNOST, *supra* note 13, at 130.

[226]"Trends analysis" or a review of matters in the past relevant to the realization of the goal of a global climate change treaty is necessary to identify possible strategies available for the future realization of this goal and to predict whether such a goal is achievable. *See* REISMAN & SCHREIBER, *supra* note 93, at 16.

[227]Lyman, *supra* note 18, at 12.

[228]Holley, *supra* note 54, at 68.

production and consumption of controlled substances, placing a limit on the total calculated level of production, based on 1986 levels, of any combination of substances in a group. The updated accord tightens the restrictions of the 1987 Agreement by expanding its scope and stringency.[229]

What distinguishes the treaty are two elements. First, it was aggressive in that it set target dates for reduction even though technologies for compliance with the goals do not yet exist. Second, the Montreal Protocol was the first international agreement to provide for an international Secretariat for monitoring, reporting and organizational purposes. Thus, a valuable precedent was established: a supranational organization can be used to supervise the implementation of international environmental treaties.[230]

The Montreal Protocol is also a significant convention because it symbolizes a fundamental change both in the kind of problems facing the modern world and in the way the international community can approach these problems. Ozone depletion, like global warming, reflects this new generation of issues manifesting the interconnectedness of life and its natural support systems on this small planet, "where localized activities can have global consequences, and where dangers are slow in developing, long-term in their effects, and not readily reversible."[231] The international community confronted a threat which could affect every nation and all life on earth and although the consequences were potentially disastrous, they could not be observed or predicted with certitude.[232] Thus, the Montreal Protocol is a model for decision-making under uncertainty: "international consensus was forged on a balance of probabilities, where the risks of waiting for more complete evidence were finally deemed to be too great."[233] As a participant in the negotiating process noted,

> the negotiators weighed the social and economic costs of replacing substances which contribute in many ways to modern standards of living, against hypothetical dangers based on analysis at the frontiers of modern science. All this was done before there was measurable

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[229]*Id.*, at 69.

[230]*Id.*, at 77.

[231]Benedick, *The Montreal Ozone Treaty: Implications for Global Warming*, 5 AM. U.J. INT'L. L. POL'Y 227, 228 (1990).

[232]The latest development on ozone depletion is the recent announcement of NASA that it has recorded the highest levels of ozone-depleting chemicals ever measured. Especially alarming was the location of the chemicals. Previously, ozone depletion affected the unpopulated South Pole. Now it threatens populous areas of Canada, New England, Asia and Europe - including London, Moscow and Amsterdam. *See* Salholz and Hager, *More Bad News In The Air*, NEWSWEEK, 17 February 1992, at 26.

[233]*Id.*

> evidence either of ozone depletion or of actual damages from increased radiation or from climate change.[234]

The Vienna Ozone Treaty and the Montreal Protocol may be remembered in history as the classic example of creating international environmental law through a process of multilateral cooperation. These agreements are the first international conventions in which states took action to prevent a global environmental problem from reaching crisis proportions, rather than reacting once it reached the crisis stage. What was also significant was the success in finding common ground between divergent national interests, particularly in overcoming the inherent conflict between industrialized and developing nations.[235]

According to Ambassador Benedick, chief negotiator of the U.S. for the Montreal Protocol, there are four lessons that can be discerned from the ozone negotiations. First, that building scientific consensus is central. This requires mobilizing the best possible scientists and the most advanced technological resources in a cooperative international effort. According to Benedick, the development of a commonly accepted body of data and analysis and the narrowing of the ranges of uncertainty were crucial in ensuring a political consensus among negotiating states initially far apart in their positions.[236] Second, public opinion must be adequately informed in order to mobilize the political will of nations. The temptation to overstate the case must however be resisted as exaggerated claims can backfire and provide ammunition to those who want to obstruct action. The case for ozone protection was built step-by-step and generally avoided invoking apocalypse.[237] Third, the process established in the Protocol offers instructive insights for approaching other global issues. For example, the idea of "disaggregating" a complex problem is a strategy so apt for climate change since it has so many aspects that it is impossible to deal with everything at once.[238] Finally, the mediating function of an international organization like UNEP can be critical. According to Benedick, in the ozone negotiations, UNEP went far beyond a traditional secretariat function and was a leader in mobilizing data and informing world opinion as well as a driving force in achieving the eventual consensus.[239]

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[234]Benedick, *supra* note 231.

[235]Noble-Allgire, *The Ozone Agreements: A Modern Approach To Building Cooperation and Resolving International Environmental Issues*, 14 S. ILL. U.L.J. 265, 317-318 (1990).

[236]Benedick, *supra* note 231, at 230.

[237]*Id.*

[238]*Id.*, at 231.

[239]*Id.*

International treaties on global warming will of course be far more complex than the ozone agreements. While ozone depletion is caused mainly by a particular class of industrial chemicals, many of which can be replaced, global warming is caused by gases that are central to the activities of modern industrial societies.[240] Thus, with global warming, the world community is faced with more economically painful choices. While some industries, such as foams, aerosols and refrigerants, have flourished since the development of CFCs, whole economies have not evolved around them. Moreover, developing states contribute less than 6% to the total production of CFCs. In contrast, almost all of the remaining greenhouse gases result from energy sources crucial to both the industrialized and developing world. Indeed, the pervasiveness of greenhouse gas-emitting substances in the everyday existence of almost all societies makes it far more difficult to regulate than CFCs.[241] Notwithstanding these important distinctions, the ozone depletion experience is reason for believing that a global warming agreement is not impossible.

9. A Synthesis: Outcomes of The Decision Process

Outcomes can be described by specifying the things human beings value.[242] These have been said to correspond to eight values: power, wealth, enlightenment, skill, well-being, affection, respect and rectitude.[243] With respect to global warming, it is clear that the values the international community is concerned with are that of wealth and well-being. For the debate engendered by global climate change is really a debate on quality of life now and in the future for the world community and its members.

A major hurdle to consensus on global climate change is the economic consequences of an agreement restricting the use of fossil fuels. An agreement could significantly alter lifestyles that have grown dependent upon abundant fossil fuel supplies, a change which would likely have a major impact upon human society, sparing neither the developing world nor the industrialized countries.[244] Those who advocate that immediate and drastic steps are necessary to contain and reverse global warming are willing to err on the side of ecological well-being. On the other hand, those who want to wait until there is more scientific certainty are concerned that such steps would considerably

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[240]Flavin, *supra* note 4, at 66.
[241]Holley, *supra* note 54, at 70-71.
[242]*See* REISMAN AND SCHREIBER, *supra* note 93, at 4.
[243]*Id.*, at 14-15.
[244]Nanda, *supra* note 42, at 392.

reduce their respective societies' capacity to generate wealth. Thus the conflict is between critical economic and ecological issues and this is reflected in the perspectives of all the participants in the decision process.[245]

This opposition of perspectives is not irreconcilable. The truth is that wealth and well-being are intimately linked with each other and it is in the unity of these two values that are seemingly in conflict in the issue of global climate change that one can find hope that a solution may be found. Economic development and ecological protection need not, and must not, be seen as incompatible goals of the world community. They are, in fact, in the long run, inseparable. The challenge is to formulate an effective international legal framework in which both goals can be pursued cooperatively by states whose priorities differ.[246]

The choice is not one value over another but that of what value takes precedence at this point in global history. And that choice is increasingly becoming clear: common interest demands that well-being of the world community be given a higher priority. While it may appear that the special interest of some countries, from the viewpoint of the value of wealth, is to delay action on climate change, a more rational look would reveal that such special interest itself demands action now. The point is that in the issue of global warming, there is a convergence of common and special interests and of wealth and well-being as outcomes.[247] Hence, in spite of what appears to be insurmountable odds, the chances for an acceptable agreement soon, if not by June 1992, is bright.

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[245]This conflict was reflected in the 44'th General Assembly debate at the United Nations. It was, according to one U.N. environmental official, "the most difficult General Assembly ever," not only because environment had risen to the top of the political agenda but because "it is also becoming an increasingly politicized - and even polarized - issue." This emerged clearly, he said, on three major resolutions adopted last year: on climate, the illegal traffic in toxic and dangerous products, and especially the forthcoming UNCED. On all these issues, a major sticking point was North-South conflict over the economic ramifications of protecting the environment. *See* TESSITORE & WOOLFSON, *supra* note 201, at 103.

[246]A. SPRINGER, THE INTERNATIONAL LAW OF POLLUTION 24 (1983).

[247]It has been noted that the many benefits of a successful effort to combat global warming would go beyond climate stabilization. Economies would be strengthened, new industries created, air pollution reduced, and forests preserved. For the human community, it would be another step in the evolution of international society, demonstrating the ability to work cooperatively as a world community. *See* Flavin, *supra* note 4, at 74.

IV. THE CONSTITUTIVE PROCESS OF INTERNATIONAL ENVIRONMENTAL LAW

Four themes in the constitutive process of international environmental law emerge in the preceding discussion of the global warming negotiations: first, the world community's growing concern over the global environment and the role of international law in determining the community's response to this concern; second, the conflict and dialogue between North and South that characterizes the decision process on international ecological issues; third, the dialectics in this decision process between and among states, intergovernmental institutions and non-governmental organizations; and fourth, the increasing demand, as a consequence of global environmental problems, for the evolution of new concepts in international law.

1. The Global Environment and International Law

The global warming crisis and the international response it has generated is an indication of how concern for the global environment is increasingly becoming a dominant issue in the interaction between members of the world community. With the end of the cold war, international stability remains elusive, with the environment becoming a primary international security problem. For example, since global climate change will benefit some states and regions, but will prove disastrous for others, "instability may be expected promptly to be exported."[248] In this way, environmental destabilization "threatens to be just as dangerous as the perceived imbalance in armaments during the cold war."[249] As one scholar describes it,

> the search for national security in the modern world must somehow take account of this objective reality: demographic, economic and environmental world trends have combined in recent years to create a qualitatively distinct class of unavoidable world-level problems that are virtually unknown to traditional diplomacy - that are beyond the reach of national governments, that cannot be fitted into received traditions of interstate relations, that cannot be wished away, that are coming increasingly to dominate world affairs, and that are utterly indifferent to military force.[250]

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[248]Reisman, *International Law After The Cold War*, 84 A.J.I.L. 859, 863 (1990).
[249]TESSITORE & WOOLFSON, *supra* note 201, at 100-101.
[250]Wilson, *supra* note 92, at 72.

The primacy of environmental pressures as a global security concern is manifested in many ways: in the flood of international environmental refugees, the increase in conflicts over natural resources, and, more positively, in the growing awareness that political boundaries cannot isolate states from environmental threats.[251] This recognition that environmental problems transcend the world's boundaries implies that environmental law must likewise transcend those borders. Unfortunately, this awareness for a strong body of international environmental law has, in Tolba's words, "been hesitant - too hesitant": with ecological problems becoming rapidly more international with each passing year, the progress that have been achieved is in danger of being overtaken by events.[252]

The problem is that national policies are usually formulated in the short term. Because of other pressing national and international problems, such as a failing economy or the regional conflicts in the Middle East, Africa and Eastern Europe, "environmental policies are likely to fall by the wayside" unless states are legally bound to abide by the terms of international environmental regimes.[253] The demand therefore is for remedial measures or technical solutions which would be effective through time and which "must eventually extend to planning, development, and controls which are comprehensive, integrated and rational for the whole global community, as well as for its many internal communities" for "no national community today can be an island in a universe of interdetermination."[254]

The concern for the environment and the recognition of the role of international law in this area is not a new idea. As early as 20 years ago, McDougal pointed out that it is a misconception to think that "while environmental problems are global in their reach, the processes of law are not."[255] He argued that the international community

> does exhibit a constitutive process that, although it has not achieved that high stability in expectations about authority and degree of effective control over constituent members that characterize the internal processes of some mature national communities, still affords, in at

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[251]Tolba, *supra* note 56, at 240.

[252]*Id.*

[253]Holley, *supra* note 54, at 80.

[254]McDougal, *Legal Bases For Securing The Integrity Of The Earth-Space Environment*, 184 ANNALS OF THE N.Y. ACAD. OF SCI. 375 (1971), reprinted in M. McDougal & W. M. Reisman, INTERNATIONAL LAW IN CONTEMPORARY PERSPECTIVE 761, 762-63 (1981).

[255]*Id.*, at 101.

> least rudimentary form, all the basic features essential to the effective making and application of law on a global scale.[256]

McDougal then observed that

> this emerging transnational constitutive process of authoritative decision has been expanding and improving itself at an accelerating rate, and it would not appear that vast, and possibly grandiose, structural alterations are any more necessary for coping with environmental than for other problems. Conversely, environmental problems would indeed appear so global in their reach and so immense in proportion that a whole global process for the continuous clarification and implementation of common interest, and not merely some new specialized organization or cluster of organizations, is required for their management and amelioration.[257]

The key principle in this constitutive process is the recognition that the world's resources are the common patrimony of the whole of humanity. The prevalence of a civilization of science and technology brings with it an "increasingly common map of reality and expectation about social process and environment for all men."[258] Hence, modes of exploitation of resources are to be evaluated in terms of "their aggregate consequences for all who are affected," and costs-benefit analyses have to be "extended beyond mere quantitative calculations about wealth to qualitative assessments of impacts upon the shaping and sharing of other representative values such as power, enlightenment, respect, health, skill, rectitude and affection."[259] A good example of this principle is the global atmosphere, which as a universal common property resource "cannot, in its entirety, be divided into parcels each of which would be subject to nation state sovereignty."[260] Direct consequences of climate change, such as what global warming brings, on the atmosphere of one state can be the indirect effect of the political, economic and ecological policies of other states.[261]

It was also twenty years ago when the first United Nations Conference on the Human Environment was held in Stockholm in June 1972. As the first opportunity in which the political, social, and economic problems of the world environment were threshed out at an intergovernmental forum with the intent to take corrective action, the Stockholm Conference was without doubt the most significant event in

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[256] *Id.*
[257] *Id.*
[258] *Id.*, at 102.
[259] *Id.*, at 762.
[260] Sherk, *supra* note 170, at 124.
[261] *Id.*

the growth of international environmentalism.[262] The aim was to "create a basis for comprehensive consideration within the United Nations of the problems of the human environment" and to "focus the attention of Governments and public opinion in various countries on the importance of the problem."[263]

The Stockholm Conference, in its Declaration, recognized that the protection and improvement of the human environment was a major issue which affected the well-being of peoples and economic development throughout the world.[264] The signatories to the Declaration admitted that

> a point has been reached in history when we must shape our actions throughout the world with a more prudent care for their environmental consequences. Through ignorance or indifference we can do massive and irreversible harm to the earthly environment on which our life and well-being depend . . . To defend and improve the human environment for present and future generations has become an imperative goal for mankind - a goal to be pursued together with, and in harmony with, the established and fundamental goals of peace and of world-wide economic and social development.[265]

Finally, the Stockholm Declaration identified a growing class of environmental problems which "because they are regional or global in extent or because they affect the common international realm, will require extensive cooperation among nations and action by international organizations in the common interest."[266]

The Stockholm Declaration however, in hindsight, was inadequate in that it established nothing more than non-binding principles. While such principles, constituting "soft law", do have a certain utility, the enormity of environmental problems demand more stringent international regimes.[267]

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[262]J. McCORMICK, RECLAIMING PARADISE 88 (1989).

[263]*Id.*

[264]DECLARATION ON THE HUMAN ENVIRONMENT, The Stockholm Conference of 1972 (16 June 1972) U.N. Doc. A/Conf. 48/14, reprinted in M. McDougal & W. M. Reisman, INTERNATIONAL LAW IN CONTEMPORARY PERSPECTIVE 769-70 (1981).

[265]*Id.*

[266]*Id.*

[267]It is interesting, for example, to note that as early as the Stockholm Declaration, the following principle was recognized by the world community: "The discharge of toxic substances or of other substances and the release of heat, in such quantities or concentrations as to exceed the capacity of the environment to render them harmless, must be halted in order to ensure that serious or irreversible damage is not inflicted upon ecosystems." In spite of this principle, laid down twenty years ago, the world community

What is new therefore in the international community's contemporary concern for the global environment is the perception of primacy and urgency. And with respect to the role of international law, it has become increasingly clear, as the discussion on global warming has revealed, that there is a need to develop more comprehensive and effective global regimes if worldwide ecological degradation is to be reversed. Hence, statements of concern and general principles are no longer sufficient. Prescriptive processes in the world community can be effective, rational, and inclusive, only if they are backed up by processes of effective control.[268] The question is how to evolve international regimes which meet the appropriate balance of authority and control.[269]

2. *North and South in International Environmental Law: Conflict and Dialogue*

A second theme in the constitutive process of international environmental law, which emerges from the discussion of the world community's response to global warming, is the conflict and dialogue between North and South which characterizes this decision process.

As elaborated earlier, developing states have time and again, in the global warming negotiations, maintained that their contribution to the international response to the greenhouse challenge should be in a way that enhances, rather than diminishes, development prospects; where these are in conflict, priority should be given to development.[270] Thus, in confronting global climate change, the institutional issues that must be addressed include the structure of east-west and north-south trade, patterns of Third World debt, facilitating the transfer of new technologies, restructuring taxation and subsidy policies that deter

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is confronted today with such problems as acid rain pollution, ozone depletion and global warming.

[268]McDougal & Reisman, *supra* note 8, at 378.

[269]According to McDougal and Reisman: "The relative importance, within the prescribing function, of the control and authority components may vary with, among other things, the type of prescription being communicated, the level of crisis, and the nature of the community. In an integrated community in which authority is relatively stable and internalized in participants, authority may be the major sustaining and characterizing factor in prescription but in a less integrated community, control may be the primary characterizing and sustaining element of prescription." *See* McDougal & Reisman, *supra* note 8, at 356.

[270]*See* INTERNATIONAL CONFERENCE ON GLOBAL WARMING AND CLIMATE CHANGE: PERSPECTIVES FROM DEVELOPING COUNTRIES, *supra* note 1, at 554.

energy investment in many countries, agricultural and forestry policy development, and consumption patterns.[271]

Unless policymakers in the North are prepared to confront the linkage between the emission of greenhouse gases and economic development in a constructive manner, any convention that emerges from the deliberations of the Intergovernmental Negotiating Committee on Climate Change will be ineffectual.[272] A failure to recognize these linkages will prevent new structural arrangements from dealing effectively with large-scale environmental issues. If Southern decision-makers perceive efforts to contain global warming or to preserve biological diversity as initiatives which are likely to derail efforts of developing societies to attain economic growth, no cooperation will be forthcoming from the South.[273]

This conflict between North and South is not new in the area of the global environment. As far back as the Stockholm Conference, the debate between North and South - with their divergent perspectives of environmental priorities - was brought into the open.[274] The Stockholm Conference, forced a compromise between these perceptions of the environment leading ultimately to a much wider view being taken of the roots and causes of the environmental crisis.[275] Before 1972, ecological priorities had been determined largely by developed states; after Stockholm, the needs of developing countries became a key factor in determining international policy.[276]

In the last 20 years following Stockholm, it has become increasingly obvious to the North that the South is far from able to respond to contemporary ecological dangers. Without its support, the developing world will not be able, on its own, to confront the relentless escalation of ecological degradation. The implication is that eventually, the developed world could find itself an ecological hostage.[277] Hence, what the global environmental situation demands is a "coalition of reason"; in particular, a rapid reduction of both North-

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[271]WORLD RESOURCES, *supra* note 23, at 29.

[272]YOUNG, DEMKO, & RAMAKRISHNA, *supra* note 167, at 25.

[273]*Id.*, at 16.

[274]McCormick, *supra* note 262, at 88.

[275]A good example of this compromise is Recommendation 103 of the Conference Declaration which stated that governments take the necessary steps to ensure that all countries represented at the Conference agree not to invoke environmental concerns as a pretext for discriminatory trade policies or for reduced access to markets and recognize further that the burdens of the environmental policies of the industrialized countries should not be transferred, either directly or indirectly, to the developing countries. *See* DECLARATION ON THE HUMAN ENVIRONMENT, *supra* note 264, at 771-772.

[276]McCormick, *supra* note 262, at 104-105.

[277]*See* GREENHOUSE GLASNOST, *supra* note 13, at 264.

South inequalities and East-West tensions is required if the world community is to achieve the understanding and agreements needed to secure a substantial future for the planet and the human community.[278] Such a coalition has been accepted as necessary by the major economic powers of the world. In its 1991 London Summit, the leaders of these powers admitted that:

> Internationally, we must develop a cooperative approach for tackling environmental issues. Industrial countries should set an example and thus encourage developing countries and Central and East European nations to play their part.[279]

While the conflict between North and South in how global ecological issues are perceived is not new, what is new is the growing ability to bridge this gap. Both North and South have learned to go beyond their narrow special interests and appreciate the imperatives of their common interest. As noted earlier, this can be explained by the fact that in many of these global environmental problems, special interests converge with common interest. Finally, what is also significant are the indications that the traditional North-South divide is no longer as valid today as it was twenty or even five years ago. Coalition of interests in the ozone as well as global warming negotiations often reveal a blurring of lines, where a group of developed states would share the same position with a group of developing states.

3. *States, Intergovernmental Institutions and Non-Government Organizations in International Environmental Law*

In the international community, "the process of communication by which prescriptions are generated range from the most formal, organized, and specialized through many gradations to the most informal, unorganized and nonspecialized."[280] This is the case in the constitutive process of international environmental law. The decisions being made by the global community in this area result not merely from the interaction of states but involve the participation as well of many intergovernmental institutions and non-governmental institutions. Indeed, "participation in world constitutive process, as in the embracing process of effective power, has been tremendously democraticized:" nation-states, intergovernmental institutions, political parties, pressure

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[278]*See* THE CHANGING ATMOSPHERE: IMPLICATIONS FOR GLOBAL SECURITY, *supra* note 39, at 520.

[279]ECONOMIC DECLARATION OF THE G-7 LONDON SUMMIT, reprinted in BNA International Trade Daily, 26 June 1991.

[280]McDougal & Reisman, *supra* note 8, at 357.

groups, private associations, and individuals play significant roles.[281] While some official fora remain closed to some effective participants, the general trend is toward openness and "a parallel movement toward making appearance compulsory for participants whose choices in fact affect community policy."[282] According to McDougal and Reisman,

> the diversity and abundance of the processes of communications by which prescriptions, that is, the projections of policy attended by expectations of authority and control, are created in the contemporary world arena are staggering. The peoples of the world communicate to each other expectations about policy, authority, and control, not merely through state or inter-governmental organs, but through reciprocal claims and mutual tolerances in all their interactions. The participants in the relevant processes of communication, the communicators and the communicatees, range from the most specialized to the least specialized in prescription, and include not merely the officials of states and inter-governmental organizations but also the representatives of political parties, pressure groups, private associations, and the individual human being qua individual, with all his or her identifications.[283]

The primary participants in the international decision process regarding environmental problems are still the states. But as the global climate issue has shown, the increasing role of intergovernmental institutions and non-governmental institutions as participants in that process cannot be underestimated.[284] In studying and exposing ecological problems, in developing and promoting possible strategies, in providing venues for discussion and negotiations, in persuading governments to adopt particular stances - these intergovernmental institutions and NGOs play a central and indispensable role.

Among the many intergovernmental institutions, the crucial ones for ecological issues include the General Assembly of the United Nations, the UNEP and other related agencies such as the Food and Agricultural Organization (FAO) and the United Nations Population Agency (UNPA), special entities such as the UNCED Secretariat and Working Committee and the Intergovernmental Panel for Climate Change (IPCC), and multilateral financial institutions such as the World Bank and the Asian Development Bank.

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[281] McDougal, *supra* note 254, at 101.

[282] *Id.*, at 102.

[283] McDougal & Reisman, *supra* note 8, at 368.

[284] A participant in the constitutive process is an individual or an entity "which has at least minimum access to the process of authority in the sense that it may make claims or be subjected to claims." While traditional doctrine holds that only states are "subjects" of international law, there has always been a wide gap between this doctrinal position and practice. While official forums have tended to establish stringent requisites for participation, unorganized arenas have not. And since 1945, the trend has clearly moved toward broader participation. *See* McDougal & Reisman, *supra* note 5, at 222-23.

The main contribution of these intergovernmental institutions is that they have provided an abundance of "diplomatic, parliamentary, mixed diplomatic and parliamentary, adjudicative, and executive arenas" in which the other actors in the decision process - states and NGOs included - can interact.[285] In particular, the role of the General Assembly of the United Nations is increasingly significant: it is "a relatively universal parliamentary forum in which the peoples of the world can deliberately, with whatever comprehensiveness and precision they desire, proclaim what they think the law to be."[286] While what is declared or decided in the General Assembly is not necessarily legal prescription, it is often in the debates within the assembly that momentum is gathered towards negotiations or adoption of a norm regarding particular issues.

Even the so-called "functional" international organizations, "which concern themselves with one aspect of a value process, treating it as a separable and discrete phenomenon" and which claim to be non-political, have significant impact on the constitutive process.[287] The IPCC, for example, by issuing a report containing grim predictions for the future and calling for immediate action, played a crucial role in pressuring states to take action on global climate change. Likewise, a financial institution like the World Bank, by the lending policies it establishes, has a tremendous impact on international ecological issues and the positions that developing states may eventually take on such issues.

Like intergovernmental institutions, non-governmental organizations also have an important role in the decision process.[288] While NGOs also study and expose environmental problems, develop and promote policy options, provide arenas for discussion and negotiations, their major impact is in pressuring governments to take action. Domestic NGOs do this with respect to their specific governments while international NGOs apply pressure on a larger scale. By mobilizing popular opinion on a national and global scale, NGOs often succeed in compelling states to act sooner than they are usually ready to. And they have been largely successful. This success, usually

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[285]McDougal, *supra* note 254, at 102.

[286]McDougal & Reisman, *supra* note 8, at 366-67.

[287]McDougal & Reisman, *supra* note 5, at 227.

[288]As far back as the Stockholm Conference in 1972, where more than 400 were officially represented, NGOs already played a significant role in environmental issues. The Post-Stockholm era saw renewed growth in the NGO movement. By 1982, there were an estimated 2,230 environmental NGOs in developing countries, of which 60% had been formed since Stockholm, and 13,000 in developed countries, of which 30% had been formed since Stockholm. *See* McCormick, *supra* note 262, at 100-101.

obtained in unorganized arenas, is a manifestation of what has been called the inaccuracy of the assumption that "organized institutions always perform more efficiently than the non-organized."[289]

Both the strength and weakness of non-governmental organizations comes from the fact that "officially" they are not "subjects" of international law. This is a weakness because it restricts their access to organized venues in the decision process. Thus, calls have been made to recognize the political reality that NGOs are important participants in international society by giving this legal expression.[290] Some have argued that international law should recognize NGOs as legal guardians of ecological rights. Specifically, NGOs should be granted legal standing to enforce these rights by negotiating with states and appearing before international institutions and tribunals.[291] Until the international law system rejects the view that international society comprises only a community of states and comes to recognize the persons (both legal and natural) within those states, "it will not be able to provide even the most elementary framework for the protection of the environment."[292]

On the other hand, NGOs derive much of their strength from the fact that they are not recognized as "official" participants in the organized arenas of the decision process. By being "outsiders", NGOs are able to get away with tactics and strategies that would be frowned upon if they were "official" participants. By not being bound to the organized process and its rules, NGOs have much wider latitude and freedom of action than states or intergovernmental institutions.

To conclude, this discussion shows that international environmental law today is a consequence of the interaction in organized and unorganized arenas of states, intergovernmental institutions and non-governmental organizations. The implication of this fact is that the traditional doctrine of international law being made by sovereign states is clearly no longer tenable. And what explains the obsoleteness of the old doctrine is that the world has changed and the problems of the contemporary global community are different.

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[289]McDougal & Reisman, *supra* note 5, at 374.

[290]Some NGOs have been granted observer or consultative status in certain international institutions, a recognition of their legitimate interest in certain fields of international affairs. Consultative status at the International Atomic Energy Agency, for example, may be granted to organizations "having special competence in the field." *See* IAEA, Rules on Consultative Status of Non-Governmental Organizations with the Agency, IAEA Doc. INFCIRC/14, Nov. 7, 1959, cited in Sands, *supra* note 197, at 415.

[291]Sands, *supra* note 197, at 394.

[292]*Id.*, at 399.

First, in recent years, human society has become global in the real sense of the word: international society is no longer just a community of nation states - it includes as well the individuals, peoples and other domestic constituencies which comprise these states, the international organizations that have emerged in the direct encounter of these individuals, peoples and constituencies, and the intergovernmental institutions established in the interaction among states. Second, the problems confronted today by the world community are also truly global: these problems require a response not only from states but from all of human society, a responsibility recognized twenty years ago by the participants in the Stockholm Conference when they recognized that the problem of environmental degradation "will demand the acceptance of responsibility by citizens and communities and by enterprises and institutions at every level, all sharing equitably in common efforts. Individuals in all walks of life as well as organizations in many fields, by their values and the sum of their actions, will shape the world environment of the future."[293]

4. *Rethinking International Liability Rules and State Sovereignty: The Evolution of International Environmental Law*

A final theme which emerges from the analysis of the international response to global climate change is the growing demand to reconceptualize international environmental law. Two concepts have been identified as requiring rethinking: first, international liability rules as they exist today; second, the notion of state sovereignty as the cornerstone of the international legal system.

There is a clear need to assess the contemporary utility of traditional concepts of liability in international law. It is true that the principle of state responsibility is a well settled rule. As far back as the Corfu Channel case in 1948, the International Court of Justice already stated that "every State has an obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States."[294] The private law rule "sic utere tuo ut alienum non laedas," which prohibits the use of one's own property in such a way as to injure another's property, thus has a corollary in international law and has been applied to international watercourses, transfrontier pollution, and marine pollution.[295] Principle 21 of the Stockholm Declaration, which

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[293]DECLARATION ON THE HUMAN ENVIRONMENT, *supra* note 264, at 769-770.

[294]Corfu Channel Case (Merits) (U.K. v. Albania), 1949 I.C.J. 4, 22.

[295]Nanda, *supra* note 42, at 382-83.

seeks to balance a nation's right to exploit its environment with its responsibility to avoid harm to other states and the world community, likewise provides that

> states 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.[296]

The principle of state responsibility for transboundary environmental damage was explicitly recognized in the Trail Smelter Arbitration case involving Canada and the United States. In that case, the tribunal concluded that:

> . . . under the principles of international law . . . no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.[297]

The Trail Smelter case has been praised and described as the "grandfather" of international environmental law.[298] However, a close scrutiny of this decision reveals the inadequacy of the present liability rule. First, the rule assumes definite and identifiable polluters and victims. Second, the principle laid down applies only when injury or damage has already occurred. Third, the standard of "clear and convincing evidence" may be insurmountable in certain contemporary ecological problems. Fourth, international liability rules are centered mainly on compensation for the affected parties.

The usual method to regulate harmful activity that results in environmental damage to other states is to hold the responsible state to which the activity is attributable liable for any injury caused. But there is no liability incurred until after the activity takes place or the effects are created. Thus, the goal of preventing ecological degradation may not be attained because state responsibility can only be invoked after pollution occurs.[299] Moreover, under the traditional doctrine, a victim state must hurdle relatively restrictive standards to invoke the responsibility of another state for ecologically harmful activity. Injury must be proven to an interest that the victim state is legally entitled to protect. According to Springer,

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[296]Report of the U.N. Conference on the Human Environment, U.N. Doc. A/CONF. 48/14/Rev. 1, at 3, 5 (1973).

[297]3 U.N. REP. INT'L. ARB. AWARDS 1905 (1949), reprinted in M. McDougal and W.M. Reisman, INTERNATIONAL LAW IN CONTEMPORARY PERSPECTIVE, 763, 766-767 (1981).

[298]Peters, *supra* note 132, at 74.

[299]Springer, *supra* note 246, at 130.

> this raises questions, not only of the kinds of interests that are legally within the purview of the claimant, but also of the degree of damage that must be linked, in the words of the Trail Smelter arbitral tribunal, by "clear and convincing evidence" to a source of pollution for which the would-be defendant state is responsible in international law. Presuming such standards can be met, there is still the problem of the forum in which claims can be brought either by the state or by other injured parties.[300]

Contemporary state liability doctrine is clearly inadequate for problems like global climate change since the rule does not respond to the complex scientific and political issues that characterize the issue. First, the sources of the emissions which result in global warming, which is the combined effect of activities of many states, are widespread. Global warming is the combined effect of emissions from many nations.[301] Second, the time gap between the emissions and their negative effects makes the application of international liability rules very difficult.[302] Third, what is called for in global warming is not compensation but the cessation of harmful polluting activity.[303]

What this criticism of contemporary state liability doctrine reveals is the need to evolve a new approach to govern state actions with ecological consequences.[304] This new framework should be based on

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[300]*Id.*, at 32-33.

[301]The International Law Commission of the United Nations has recently examined "international liability for injurious consequences arising from acts which are not prohibited under international law." As the Special Rapporteur of the Commission's study remarked, however, the approach is based on state obligations to take preventive measures, to consult, and to make reparations in case of harm. Since those "obligations presupposed an identifiable State of origin, affected State and identifiable harm . . . the framework of the topic did not seem to be appropriate for dealing with harm to the human environment as a whole, when there were many States of origin and virtually the whole community of mankind was affected." *See* Report of the International Law Commission on the Work of its Thirty-Ninth Session, 42 U.N. GAOR, Supp. (No. 10) at 102-03, U.N. Doc. A/42/10 (1987), cited in Nanda, *supra* note 42, at 383.

[302]See Nanda, *supra* note 42, at 382.

[303]According to Nanda: "The threat of liability for damages may be useful in encouraging nations to adopt preventive measures in certain areas of concern to the international environment. Such incentives will be minimal, however, with respect to global warming for several reasons. First, physical damage to many nations of the world will result if global warming effects occur. Second, the cause will not be traceable to a single nation or a small group of states, making international legal precedents unlikely models for imposing liability. Finally if global climate change does occur (and traditionally damage must occur before liability can attach), monetary damages would not compensate adequately for the damages sustained. No amount of money will allow a nation to purchase a more favorable weather pattern, a cooler climate, or adequate rainfall." Nanda, *supra* note 42, at 383-84.

[304]The Stockholm Conference already recognized this need as far back as 1972. At that time, the Conference called on states "to cooperate to develop further the international

cooperation rather than liability. While the doctrine of international liability for harm is a fruitful starting point, an approach premised on international cooperation will be more effective.[305]

There is also a need to rethink the concept of state sovereignty as the foundation of international law. The emergence of the ecological issues that the world community now confronts demands this reevaluation. The acceptance that such issues transcend state boundaries has been accompanied by the recognition that ad hoc and disparate responses by individual nations is not sufficient. Ozone depletion, global warming, tropical rainforest destruction, air and marine pollution, toxic waste, and the destruction of biodiversity are interrelated threats facing the global community. It is doubtful whether traditional doctrines of international law will succeed in establishing effective regimes protecting the environment. And among these doctrines, the concept of state sovereignty, which underpins the international legal system, presents insurmountable obstacles when the issues to be addressed are transnational in scope.[306]

Under the traditional system, few restrictions exist on the right of states to engage in activities that threaten to damage the environment. States share a common interest in maintaining as much discretion as possible in the use of natural resources found within their respective territories.[307] Thus, the emphasis under the present system is permanent and exclusive state control of resources within its boundaries.[308] Any effort to control deforestation or industrialization, for example, "frontally assaults cherished notions of national sovereignty over the exploitation of a state's natural resources."[309]

There is doubt whether this system is adequate to resolve the disputes that arise over ecological problems. More importantly, scholars have questioned its capacity to evolve a constructive, forward-

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law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction and control of such States to areas beyond their jurisdiction." See DECLARATION ON THE HUMAN ENVIRONMENT, *supra* note 264, at 770-771.

[305]Nanda, *supra* note 42, at 384-85.

[306]Sands, *supra* note 197, at 393.

[307]Springer, *supra* note 246, at 130.

[308]A manifestation of this doctrine is Resolution 1803 of the U.N. General Assembly declaring that "the right of peoples and nations to permanent sovereignty over their natural wealth and resources must be exercised in the interest of their national development and of the well-being of the people of the State concerned." (Dec. 14, 1962, G.A. Res. 1803, 17 U.N. GAOR, Supp. (No. 17), 15 U.N.D.C. A/5217 (1963) reprinted in M. McDougal and W.M. Reisman, INTERNATIONAL LAW IN CONTEMPORARY PERSPECTIVE 47 (1981).

[309]Weiss, *supra* note 77, at 182.

looking framework for environmental protection since this system extends to the state a degree of control over activities within its national boundaries that frequently appear incompatible with effective protection of the environment.[310] As a consequence, contemporary international environmental law has been criticized as "insufficiently restrictive and creating, at best, a patchwork system of normative restraints on environmental degradation."[311] What worsens matters is the decentralized rule-enforcement process, based on national "self-restraint" as the primary means for implementing environmental obligations.[312]

The global warming problem is a good example of the inadequacy of traditional international law. An effective international regime to deal with this issue will surely dilute the traditional doctrines of equitable use, territoriality and sovereignty. There can be no equitable use of the atmosphere since all peoples and all nations, present and future, are users of the atmosphere.

Territoriality also has no place in such a regime since the atmosphere has no identifiable boundaries. Finally, since polluting activity begins in definite territory within the sovereign jurisdiction of particular states, each nation will have to surrender some of their sovereignty for the benefit of the global community.[313] While a global warming treaty could include aspects of a voluntary approach in its initial stages, it would eventually require "more draconian command and control strategies with international co-monitoring and penalties."[314] Hence, global warming poses unprecedented challenges to the traditional conception of state sovereignty.

From the preceding discussion, it is clear that while the state continues to be the most important form of political organization in global society, and the primary repository of legal power, the doctrine of state sovereignty is becoming increasingly inadequate to meet contemporary needs.[315] A system based principally on the sovereignty of states simply cannot deal effectively or equitably with the ecological problems confronting the world community. What is needed is "to evolve a strategy of transformation and to rid ourselves of illusions about what we can expect from the existing world order system."[316] In

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[310]Springer, *supra* note 246, at 31.

[311]*Id.*, at 32.

[312]*Id.*

[313]Peters, *supra* note 132, at 86-87.

[314]Holley, *supra* note 54, at 81-82.

[315]W. FRIEDMANN, THE CHANGING STRUCTURE OF INTERNATIONAL LAW 365-366 (1964).

[316]R. FALK, A STUDY OF FUTURE WORLDS, cited in Springer, *supra* note 246, at 50.

fact, some have concluded that the environmental crisis has underscored the need for "something like a responsible world government with the ability to assure the equitable distribution of the right to life, to material welfare, and to security."[317]

The fact however is that states remain the basic units in the present international political system. Contemporary developments indicate that whatever dilution in their powers may be occurring is not likely to displace states from their privileged position on the international level or to substantially erode their internal control at least in the near future. A comprehensive framework for international environmental law must accept this reality.[318] Thus, at the moment, the more effective sanction still lies in the perception by members of the world community of "their interdependencies and common interests" and in "their expectations about reciprocal, unilateral indulgences and retaliations in relation to such interdependencies and interests."[319]

Maurice Strong, former UNEP Executive Director and now Chairman of the UNCED, has suggested that "it is not a question of surrendering sovereignty, but of choosing to exercise that sovereignty collectively by agreement with other nations."[320] This concept of "merged sovereignty" first emerged at the Stockholm Conference where some participants called for the "institutionalization of new supranational loyalties to the planet and to humanity as a species."[321] But the world community, at that time, was not ready to accept the idea of subordinating state sovereignty to some form of international jurisdiction.[322] Today however, "international concern", as the inclusive competence of the general community, has expanded in relation to "domestic jurisdiction", which is the exclusive competence of states. This inclusive competence of the world community is being extended, to all issues with transnational impact which obviously includes international ecological problems.[323]

The Hague Declaration of 1989, which recognized environmental degradation as a human rights issue affecting "the right to live in dignity in a viable global environment," manifests this expansion of "international concern". The Declaration calls for the

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[317]Taubenfeld, *The Atmosphere: Change, Politics and World Law*, in WORLD CLIMATE CHANGE, *supra* note 43, at 145.

[318]Springer, *supra* note 246, at 51-52.

[319]McDougal, *supra* note 254, at 104.

[320]L. Caldwell, INTERNATIONAL ENVIRONMENTAL POLICY: EMERGENCE AND DIMENSIONS, cited in Noble-Allgire, *supra* note 235, at 317.

[321]*Id.*, at 55.

[322]*Id.*

[323]McDougal, *supra* note 254, at 102.

development of new principles of international law including new and more effective decision-making and enforcement mechanisms.[324] Accepting the need to move away from the principle of state sovereignty, under which a state cannot be bound by a rule of international law without its consent, it proposes that decision-making procedures in environmental issues be made effective even in the absence of unanimous agreement.[325] Although the Hague Declaration is not legally binding, it is important as a statement of intent from 24 states[326] at various stages of industrial development and representing diverse political views. For these reasons, the Declaration may signify a turning point in the nature, structure and function of the international legal system.[327]

V. CONCLUSION

The four themes which characterize the constitutive process of international environmental law reveal that the international legal system is constantly evolving, that the demands of a changing world require the emergence of new norms and doctrines. Traditional frameworks are not sufficient to meet contemporary problems. The challenge to the world community, and particularly to international lawyers and scholars, is "to clarify continuously the common interests of this ever-changing community," learning from policies formulated in the past but realizing that "the constitutive and institutional arrangements that were devised to achieve them may no longer be pertinent or effective."[328]

With respect to global environmental problems, the demand is clear: the common interest of the world community requires a rethinking of traditional rules, indeed, of the basic principles which underlie the present international legal system. Fortunately, through the global warming negotiations and other similar arenas, this process of appraisal and reconstitution is under way.

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[324]TEXT OF THE DECLARATION OF THE HAGUE, *supra* note 213.

[325]*Id.*

[326]The signatories of the Hague Declaration are: Federal Republic of Germany, Australia, Brazil, Canada, Ivory Coast, Egypt, Spain, France, Hungary, India, Indonesia, Italy, Japan, Jordan, Kenya, Malta, Norway, New Zealand, Netherlands, Senegal, Sweden, Tunisia, Venezuela and Zimbabwe. *See* Sands, *supra* note 197, at 395.

[327]*Id.*, at 396.

[328]Reisman, *supra* note 248, at 866.