

## CHAPTER 1

# CLIMATE DISRUPTION: REMAKING THE AGENDA OF MEAs IN ASIA AND THE WORLD

Nicholas A. Robinson

*Gilbert & Sarah Kerlin Distinguished Professor of Environmental Law  
and  
Chair, IUCN Academy of Environmental Law*

Climate Change, as the successive reports of the Intergovernmental Panel on Climate Change ably documents, is a present and real phenomenon. There is a growing realization among policy-makers, and indeed all segments of society, that the effects of climate change will make significant demands on all aspects of life. The US Supreme Court ruling in *Massachusetts v. EPA* (April 2007) illustrates this facet of human thinking. For the implications of the worst case scenario, we need look no further than the sage of New Orleans following Hurricanes Katrina and Rita.

As the field of environmental law has matured, it has pioneered and refined most of the legal and administrative methodologies that governments will need to cope with the effects of climate change. Environmental law's holistic approach — as exemplified in the scope and inter-sectoral emphasis of Agenda 21, mirrors the omnipresent challenge posed by the effects of new climatic conditions, for example: “Technology forcing”, environmental impact assessment, economic instruments for inducing sustainable practices, ambient environmental monitoring and reporting with feed-back loops to promote measures for constant improvement, public participation in environmental decision-making, and ecosystem management.

However, most nations have not established the pre-requisites for applying, much less observing, environmental laws. Lacking a

sustainable legal framework, these societies and their economies are as vulnerable as New Orleans, or the coastal communities in Asia that suffered the effects of the tsunami, or the alpine communities that lack water and snow as glaciers melt.

Scientific assessment demonstrates that the growing volume of greenhouse gases in the atmosphere cannot be contained by cap and trade commercial systems. The melt of permafrost releases gases from the once frozen tundra, and forest fires or slash-and-burn agriculture fires release more gases than do industrial sources. After 2012, there will be some sort of global cap and trade system, with major funds flowing into sequestration projects, but all other sectors in the interdependent global environment will also need to be addressed. Article 4 of the UN Framework Convention on Climate Change sets forth the agenda of topics for negotiating the addition “sister” agreements to the Kyoto Protocol.

To leverage new agreements, and to build capacity to employ the beneficial tools of environmental law, it will be necessary to understand the dynamics of how public decision-making evolves. Analysis of the “stages of environmental awareness” provides useful insights in this respect. Ultimately, Earth and her people and her nature will evolve through the era of climate change. The resulting mosaic will record winners and losers. Those that master environmental law can be among the winners; those that pretend, but persist in business as usual, will be among the losers.

Human society evolved its legal systems, including its laws for environmental quality and sustainable natural resource use, during a time of relative stability in the functioning of geological and physical systems of the Earth. Stable climatic conditions accommodated a growth in the human population from less than 1 billion people two centuries ago, to some 6 billion today. Climate change is one of many stresses that the Earth experiences as the human “foot-print” grows with its numbers.

Humans have sustained this extraordinary growth in numbers through human ingenuity. We invented new seeds to feed ever

increasing numbers of mouths, and designed electronic means of instant communications world-wide, such as the Internet. Revolutionizing agricultural production led us to — for the moment — tame famine. The revolution in information technology in turn led to a “flat Earth”<sup>1</sup> in which commercial and social interaction collapsed time-zones into a virtual reality of the moment. We moved beyond the cosmonaut and astronaut’s competing visions of Earth from space, and produced uses of orbital space once unimaginable, yielding terrestrial systems such as universal global positioning systems (GPSs) or Google Search Systems through which “Everyman” has a window on everyone else backyard. Indeed, the capacity of satellites and the recent development of powerful software for ever more powerful computers, has enabled scientists to assemble data and model the changes in Earth’s natural systems and cycles that scientists and lawyers and diplomats call “climate change.”

There are many who hope that the ingenuity of the human mind will continue to invent new ways to cope with the effects that climate change produced. Hydrogen fuel cells might replace other carbon based fuels. Solar panels might reduce sunlight to energy directly, everywhere, bypassing the need to convert solar radiation into other forms of energy. New housing models might produce buildings that in fact reuse their own water and consume and recycle the waste of these using the buildings. Bio-engineering produces new plants and animals that promise food stuffs that are resistant to disease and blight, and increase productivity to accommodate the growing global population.

It is fair to say that when the League of Nations collapsed, or the United Nations was created, none could believe that a new technological era like ours would exist, save perhaps in the imagination of Jules Verne and later science fiction writers. If we could muddle through to a world of 8 billion people, surely our past suggests that we can muddle through the challenges posed by climate change. This view

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<sup>1</sup> Thomas Freidman, *The Earth is Flat* (2005), explaining how new communications capabilities have remade both service and manufacturing industries through outsourcing and team-work around the world.

is shared by Exxon/Mobil<sup>2</sup> and by the administration of President George W. Bush.<sup>3</sup> Many industrial or political leaders agree with them.

While securing production of oil and natural gas and coal in order to meet present economic and security needs, the Bush Administration aims to work with industry to develop, deploy and trade new “clean-energy” technologies, including bio-fuels, coal-methane electricity generating facilities.<sup>4</sup> The federal government under President Bush acknowledges its commitment “to the UN Framework Convention on Climate Change and its objective of stabilizing the concentration of greenhouse gases in the atmosphere at levels that would prevent dangerous anthropogenic interference with the climate system” and expects to reduce greenhouse gas emissions by 18% from 2002 to 2012.<sup>5</sup>

Unfortunately, unlike the United Kingdom and several other industrialized nations, the USA is far from reducing its emission of greenhouse gases to the level it experienced in 1990, as contemplated when the United Nations Framework Convention on Climate Change (UNFCCC) was signed in 1992.<sup>6</sup> Moreover, although there is a great disparity in levels of development and their history of emitting greenhouse gases, most nations are in the comparable positions to that for which the USA is criticized. Emissions of greenhouse gases have grown in tandem with population growth, and new technologies that might avert new emissions and reduce them to the 1990 base year have come on line neither widely nor timely. It matters little to the atmosphere whether the State is developed or developing from the perspective of the increase in emissions alone.

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<sup>2</sup> See, e.g. “Hydrogen on Board,” installment 3 in EXXONMOBIL’s Clean Technologies Op-Ed Series, NY TIMES, p. A21, col. 3 (23 August 2007), also available at [www.exxonmobil.com/opeds](http://www.exxonmobil.com/opeds)

<sup>3</sup> See Statement by Ambassador Zalmay Khalilzad, U.S. Permanent Representative, on the UN General Assembly Thematic Debate: Climate Change as a Global Challenge, August 1, 2007, UNUS Press Release # 186(07), available at [www.un.int/usa/press\\_releases/2—70901\\_186.html](http://www.un.int/usa/press_releases/2—70901_186.html)

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

<sup>6</sup> <http://unfccc.int/resource/docs/convkp/conveng.pdf>

## 1. The Gathering “Storm”

The practical impact of the tepid pace by which nations act to implement Rio de Janeiro’s 1992 Framework Convention on Climate Change cannot be hidden. The several reports of the Intergovernmental Panel on Climate Change have documented how the increase in greenhouse gases in the atmosphere is irreparably altering Earth’s natural systems as it traps solar radiation as heat in the atmosphere. Sea levels are rising, and will continue to rise for some decades as the ice melts from the North Pole and Greenland and Antarctica, and the glaciers of all high mountains. Rainfall in tropical and subtropical areas is declining and is increasing in temperate zones,<sup>7</sup> and in the first half of 2007 alone devastating increases in flood waters were experienced from England in the United Kingdom, to North Korea, to the Bihar Province in India, to Ohio or Wisconsin in the USA. At the same time, desertification patterns are widening and temperatures rising in many locations; China has reported that the high Qinghai-Tibetan plateau and mountain areas are warming faster than any other region in the world, rising an average of 0.7 degrees Fahrenheit every 10 years.<sup>8</sup> In South Asia, the Ganges River is losing its source of water as the glaciers retreat in the Himalayan Mountains, while the Delta of the Ganges is becoming submerged as sea levels rise, displacing many communities. Pacific small island states already suffer the loss of land and the coral reefs which are essential to the life cycle of fish, their main food sources.

Actual reports of the effects of climate change confirm the impacts predicted in the models prepared by the Intergovernmental Panel on Climate Change.

From a scientific perspective, human impacts on the climate are like the genie, who, once out of the bottle, cannot easily be returned

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<sup>7</sup> NATURE, 26 July 2007. Francis Zwiers, a co-author of the NATURE report and director of the climate research division of Environment Canada, is quoted as saying “It’s the first time that we’ve detected in precipitation data a clear imprint of human influence on the climate system.” Carline Alphonso, *Toronto Globe and Mail* (24 July 2007).

<sup>8</sup> “China Considering Trading Market, Quota System,” Vol. 10, no 9 Air, Water & Climate (August 1, 2007).

to it. Some policy makers, who believe in the power of technology and have a vested interest in continuing the use of fossil fuels, believe we can get the genie back in the bottle. They will strive mightily to do so. However, what these persons fail to realize is that the bottle is now broken. The better analogy might be to Humpty Dumpty; all the King's Horses and all the King's men could not put Humpty together again.

Although there will be massive efforts at technological innovation in the coming years, and there will be a global market in emission trading to reduce greenhouse gas emissions from the industrial and transportation sectors, it may be questioned whether such measures to control industrial emissions can in fact stabilize Earth's climate conditions. There are many other sources of greenhouse gases, those which are not being addressed by technological innovation or emission trading, and these releases of greenhouse gases are very likely to continue to become even more pronounced than they are now. For instance, vast amounts of methane are encapsulated in the frozen tundra around the Arctic Circle. The tundra is melting, crumbling the buildings of the far north, and releasing their store of methane gas; tundra melt seems irreversible, and we cannot stop the incremental releases of methane.

Moreover, in tropical and temperate areas alike, forest fires burn uncontrolled. We see this from Asia, as in parts of Indonesia, to Siberia into Eastern Europe, to the Amazon and the Andes. Even States with advanced forest fire fighting capacity, such as Australia, have not been able to quell their recent vast forest fires. Although collectively these fires release as much carbon dioxide annually as do industrial processes, and forests are needed for sequestration of carbon through sustaining the photosynthesis of their flora, as yet there is *no* global campaign to help prevent and extinguish forest fires. The opposite phenomena can be seen, as economic forces clear forests in South America or Southeast Asia. For instance, the mania to find new biofuels,<sup>9</sup> such as produced from palm oil, has been a cause of the

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<sup>9</sup> See C. Ford Runge and Benjamin Senauer, "How Biofuels Could Starve the Poor," Vol. 86, No. 2 FOREIGN AFFAIRS, p. 41 (May/June 2007).

forest fires in Indonesia, with sad side effects. The Center for Orangutan Protection reports that workers on Borneo palm oil plantations have deliberately killed some Orangutans because they were eating palm seedlings; the Center reports that such killings, plus the loss of habitat for this endangered primate, has caused 1600 to die.<sup>10</sup>

## 2. Responding to Climate Disruption

Atmospheric warming causing climatic disruption will not stop soon, and the tundra will continue to melt just as the glaciers or polar ice caps continue to melt. Nations *could* assemble a global campaign to save the forests from forest fires, but since timber is a prime commodity and nations are reluctant to limit exploiting forests, there has been no significant movement to advancing global management of forests since the adoption of the 1992 Rio Conference's "Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Kinds of Forests."<sup>11</sup> Even this weak document of recommended policies managed to ignore the historic phenomenon of forest fires, evidently regarding them to be essentially a domestic matter not requiring priority international attention. As tropical and sub-tropical regions become drier, the likelihood of dangerous fires in their forests increases.

Releases of greenhouse gases from non-human phenomena and the loss of forest complicate achieving the legal objective of achieving climate stabilization through the UNFCCC's Kyoto Protocol. The focus on technological innovation to find new fuels, or use fuel more efficiently, as a higher priority than addressing forest fires, is motivated by the traditional approach of meeting the demands for profitable economic growth by finding ways to increase the supply of fuels. It is characteristically a "supply-side" management effort. There is money to be made in developing and selling new supplies of energy, and the markets invest in such efforts, and the laws promote such ends.

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<sup>10</sup> Greenwire, 27 July 2007, Environment and Energy Publishing LLC.

<sup>11</sup> A/CONF.151/26 (vol. III), 14 Aug. 1992, reprinted in 11 I.L.M. 881 (1992).

However, if we are to reduce greenhouse gas emissions, we must work much more effectively on “demand-side” management. Society has too little experience with demand-side management to understand it. Some fear that by reducing demand they will lose money, or suffer a declining quality of life. These fears, while not grounded in rational assessment, are nonetheless real, can drive public policy, and thus need to be addressed if legal techniques to advance demand-side management are to be realized. Without curbing demand, mitigation of greenhouse gases from anthropogenic sources has little chance to succeed.

Even if the methane in the tundra could be kept in a frozen encapsulation and the forest fires world-wide contained, the magnitude of the remaining controllable human activities that release greenhouse gases is formidable. In their classic essay in 2004 defining the scale of the problem, Stephen Pacala and Robert Socolow demonstrate the deep and pervasive changes that the industrial and agricultural sectors would need to make to reduce the greenhouse gases to levels that will not cause further climate disruption.<sup>12</sup> They project that fundamental changes would be required (1) in energy efficiency and conservation, and (2) in “decarbonizing” electrical generation and fuels, and (3) in enhancing use of natural sinks in forests and farm lands. However, while all the technology needed presently exists to implement their plan, when one considers the political, economic and social obstacles to deploying this technology, one may question whether such change will come, either slowly or at all. Some of the obstacles to phasing out our now obsolete technologies and practices and introducing replacements illustrate the challenges:

- (1) To realize the vision articulated by Pacala and Socolow, all cities would need rapidly to put on line the mass transit systems, and the curbs on the use of automobiles, that now exist in Singapore. Vast investment in infrastructure is needed, plus life-style changes as we remove older model cars from use and reduce use of cars

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<sup>12</sup> S. Pacala & R. Socolow, “Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies,” *SCIENCE*, Vol. 305, pp. 968–972 (August 13, 2004). See also its supporting material on line.

generally. Although public health benefits would come as a major source of urban smog is eliminated, somehow smog is growing in all cities and few cities emulate Singapore's brilliant model. As early as 1992, Agenda 21 called for such reforms, but few States or local authorities have done so.

- (2) In addition, "green" buildings would be required and older buildings be retrofitted. No building codes now require this vision, and indeed most of the nations do not even have building codes. Maximum use of solar energy photovoltaic electricity would be required, and all fossil fuel electrical generating facilities retrofitted and converted to natural gas or to non-carbon fuels or closed down. To meet growing energy market demands, however, the opposite is taking place. New plants are built burning fossil fuels, oil shale and secondary recovery is used in once abandoned oil wells in order to increase the supply of oil; very few old plants have been closed, and companies seek life-extension permits to get longer use out of their sunk costs and existing electrical generating capacity. Use of nuclear power is growing slowly, but still lacks the highly trained personnel and the security and the fuel cycle waste and reprocessing management systems to make it politically acceptable in many regions. Few developed or developing nations possess domestic capacity to build a new nuclear power plant, for instance, even the USA would have to contract with Japanese firms to build a new plant, if it could be licensed, since no current firm in the USA has built a nuclear plant or has the technological capacity to do so.
- (3) Finally, current clear-cutting of forests for timber or for agricultural expansion or crop production for biomass fuel production is eliminating forest sequestration areas. Wetlands, also rich as biotic sequestration areas, are being filled or eroded or engulfed so that their loss is rapid world-wide. Some modest afforestation is underway, but the world's once leading nation-wide afforestation programs in China are less popular today as its economic development booms and social obligations to plant trees recede. No nation is conducting afforestation at the scale needed to provide sequestration. Moreover, in conversion of forest or grasslands to agricultural uses and biofuel production, up to one-half of soil

carbon is lost, as decomposition increased by aerating organic matter during plowing and cultivation activities. Conservation tillage and soils management is needed world-wide, and yet there is no international treaty on soils, although Iceland and the IUCN Commission on Environmental Law have called for a soils agreement to be negotiated.

### 3. The Lagging Pace of International Law-Making

What is to be done?

Nations are still fixated on the an agenda of the past. They concentrate on material and manpower in military security, not on ecological security. The argue about how the developed states are responsible for the crisis and so should pay for the solution, just as the New International Economic Order<sup>13</sup> was to require the former colonial states to pay for the state of under-development in once new nations. While the developing states can win the ethical and rhetorical battle, the debate poses little likelihood that it will help cope with the effects of climate disruption.

Consider the slow pace of decision-making:

- 1972** UN Stockholm Conference<sup>14</sup> class for creating the UN Environment Programme, to monitor environmental trends and help developing nations build environmental stewardship capacity.
- 1979** The World Meteorological Organization (WMO)<sup>15</sup> convenes First World Climate Conference.
- 1980s** Canada convenes conferences to study a Convention on the Atmosphere, like one on the Law of the Sea — States decline to move ahead this idea.

<sup>13</sup> <http://lexnet.bravepages.com/NIEO.htm>

<sup>14</sup> <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=97&ArticleID=1503>

<sup>15</sup> [www.icsu.org/Gestion/img/ICSU\\_DOC\\_DOWNLOAD/863\\_DD\\_FILE\\_ICSU\\_Strategic\\_Plan.pdf](http://www.icsu.org/Gestion/img/ICSU_DOC_DOWNLOAD/863_DD_FILE_ICSU_Strategic_Plan.pdf)

- 1988** WMO and the United Nations Emergency Redistribution Program (UNERP)<sup>16</sup> convene first IPCC Session.
- 1990** United Nation General Assembly (UNGA)<sup>17</sup> Convenes the Intergovernmental Negotiating Committee for a UN Framework Convention on Climate Change.
- 1992** UN FCCC signed at Rio de Janeiro UN Conference on Environment & Development (Chaired by Ambassador, Prof. Tommy Koh).
- 1994** UNFCCC enters into force.
- 1995** First UNFCCC Conference of the Parties adopts the Berlin Mandate,<sup>18</sup> aiming to have Parties use best efforts to roll back greenhouse gas emissions to the year 1990 in order to stabilize the changing climatic conditions, with negotiation of a time-table to achieve “quantifiable emission limitation and reduction objectives.”
- 1995** Second IPCC report<sup>19</sup> — demonstrates that climate change is man-made.
- 1997** Kyoto Protocol negotiated, with its complicated, compromise(d) process to induce reductions in emissions.
- 2000** Third IPCC Report<sup>20</sup> — examines actual effects on environment of man-made climate change.
- 2005** Kyoto Protocol enters into force, with Russia vesting its emission reductions from the closing of inefficient Soviet factories and the USA refusing to participate.
- 2005** European Union inaugurates European Trading System.
- 2006** States of New York and New England in USA agree on a Northeast trading system; California establishes a trading system.

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<sup>16</sup> <http://nooventures.edublogs.org/2007-09-03-a-basic-plan-for-sharing-the-worlds-resources-from-wwwstwrnet/>

<sup>17</sup> [http://en.wikipedia.org/wiki/United\\_Nations\\_General\\_Assembly](http://en.wikipedia.org/wiki/United_Nations_General_Assembly)

<sup>18</sup> <http://unfccc.int/resource/docs/cop1/07a01.pdf>

<sup>19</sup> <http://www.ipcc.ch/ipccreports/assessments-reports.htm>

<sup>20</sup> <http://www.google.com.sg/search?hl=en&q=Third+IPCC+Report++&btnG=Search&meta=>

- 2007** Fourth IPCC report<sup>21</sup> — demonstrates climate disruption is well underway.
- 2008** UNFCCC Conference of the Parties in Bali in December, 2007, for the agreement of a negotiation road-map to 2012 and shaping post-Kyoto new agreements.

By the time major agreements are made on climate change, and barely implemented, if at all, in many States, nearly one generation of human beings will have been born. There are reasons why nations are so slow to respond to climate disruption. This pace of negotiations reflects the fact that most national leaders do not yet take climate change as a serious threat to their economic or social or environmental well-being. Although the IPCC has changed many opinions, the slow pace also reflects a lack of knowledge or study of the problem by economic and political leaders, interestingly, the leaders of multinational corporations and international financial institutions, including insurance and reinsurance companies, are responding information of climate change faster than governments. It also reflects a deep unwillingness for individuals (whether human, business or government agencies) to incur hardships in their immediate wealth in order to help resolve the common and diffuse hardship that the public, or others are suffering from climate disruption. This latter intransigence is seen the callous disregard that many nations show toward the pleas of the Association of Small Island States (AOSIS) in the UN General Assembly or in the UNFCCC COP. Finally, the climate and the environment are interdependent and complex systems, and virtually every human activity has positive or negative implications; the techniques for interdisciplinary planning and decision-making are rudimentary, despite global experience with legal methodologies such as environmental impact assessment (EIA), which have developed since 1970 to cope with a wide array of environmental problems and build sustainability into development.

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<sup>21</sup> <http://www.google.com.sg/search?hl=en&q=Fourth+IPCC+report&btnG=Search&meta=>

Although States have the technology to implement their obligations under Article 4 of the UNFCCC to stabilize atmospheric conditions from all sectors, inertia, however, and a Pollyannaish hope that “business as usual” will allow us to muddle through, prevents rapid deployment of needed technological practices and the cessation of existing practices. We have now lost nearly 30 years of response time, and locked in the concomitant changes to the climate.

#### **4. Precaution and the Scale of Responding to Climate Change**

In 1992, at Rio de Janeiro, it was expected that rapid actions might be taken to implement the recommendations of Agenda 21 and the obligations of Article 4 of the UNFCCC. In chapter 9 of Agenda 21, entitled “Protection of the Atmosphere,” States agreed to coordinate their measures to cope with climate change in an integrated way with their work for socio-economic development, “taking into account the needs of developing countries for the achievement of sustained economic growth and the eradication of poverty” (Para 9.3). In Chapter 9, many of the technological and managerial measures needed to cope with the effects of climate change were set forth.<sup>22</sup> However, few nations have implemented these recommendations.

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<sup>22</sup> States agreed in Chapter 9 that “the need to control atmospheric emissions of greenhouse and other gases and substances will increasingly need to be based on efficiency of energy production, transmission distribution and consumption and on growing reliance on environmentally sound energy systems, particularly new and renewable sources of energy” (Para, 9.11), and agreed that “more efficient design and management of traffic and transport systems” is essential (Para. 9.13), and further agreed that “Land-use and resource policies will both affect and be affected by changes in the atmosphere. Certain practices related to terrestrial and marine resources and land use can decrease greenhouse gas sinks and increase atmospheric emissions. The loss of biological diversity may reduce the resilience of ecosystems to climatic variations and air pollution damage.” (Para. 9.19). States emphasized the importance of the control measures in the Montreal Protocol to prevent stratospheric ozone depletion (Para. 9.22) and agreed to build capacity to prevent transboundary air pollution as priorities in the protection of Earth’s atmosphere. (Para. 9.26). See N.A. Robinson, *Agenda 21: Earth’s Action Plan* (Oceana Publications, 1992).

As the evidence has mounted regarding climate disruption, States have chosen to discount it. This is contrary to the norm adopted at the Rio de Janeiro Conference on Environment and Development, in Principle 15: “the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.” If States had taken the Precautionary Principle seriously, all States would now have enacted legal and other measures to anticipate, prevent or minimize the causes of climate change. Clearly announcing a principle is not enough. There must be tools put in place to make the principle operational. EIA and emission trading systems represent two variations of such tools. Among the wide array of tools that environmental law has crafted since its inception as a field of law over the past 4 decades,<sup>23</sup> is it not extraordinary that only ETS is being promoted today to address climate change? Where is integrated coastal zone management, or provision of urban mass transit?

If we consider the myriad sources of green-house gases, what should be done first? The rush to deploy biofuels and to create a new global market to cap and trade emission levels is an instinctive business as usual approach. As Pacala and Socolow demonstrate, these measures alone cannot stabilize greenhouse gases at levels that prevent further climate disruption. Environmental legal principles can offer some guidance. If nations were to deploy the precautionary principle, they would at once phase out all practices that exacerbate the greenhouse effect. In 1992, former Secretary of State James Baker called this the “no regrets policy.” His policy could have had the USA implement its UNFCCC obligations by all measures that could eliminate greenhouse gases without negative impacts on socio-economic conditions, such requiring high fuel efficiency standards in motor vehicles, or green building codes, or shifting to natural gas and out of

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<sup>23</sup> See the 2 volumes on Capacity Building in Environmental Law in the Asian and Pacific Region (Asian Development Bank), edited by Donna Craig, Koh Kheng Lian and Nicholas A. Robinson.

coal or oil combustion. These are measures that save money and are good for society, as in reducing urban smog and safeguarding public health. Taken further, the “no regrets policies” could have removed perverse tax incentives that encourage more oil and gas production, and shifting to use of solar energy or other renewable sources. However, the new Clinton Administration rejected the “no regrets” policy, was unable to secure Congressional support for the Kyoto Protocol, and thereafter the current President and Vice President regressed to once again promoting oil, gas and coal.

Embracing the precautionary principles would draw us back to at least the “no regrets policy”, and probably to the sort of “technology forcing” requirements that Congress one mandated in the Clean Air Act. In 1970, Congress adopted a law that required polluting electrical generating facilities to protect the public health by either cleaning up air emissions or shutting down operations. Industry challenged enforcement, but the Supreme Court upheld its constitutionality.<sup>24</sup> Industry then developed the new technologies, rather than relying on the “business as usual approach” which would continue to profit from extending the use of obsolete technologies just because they were paid for.

What is needed? There are a set of clear rules that oblige society to change for its own good. World economy addicted to oil will not give it up soon, but it can be persuaded to ban used cars with internal combustion engines, and replace the world’s fleet of motor vehicles with hybrid or non-polluting vehicles and mass transit. Markets will not require this change, but the parliaments can. Nations could within a year frame a global green building code, and all new construction could “go green.” Nations could at once deploy air force and army capacity to fighting forest fires, and not wasting money preparing to fight some presumed “enemy” or hostile nations. Nations could at once eliminate use of virgin forests and plant new

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<sup>24</sup> *Union Electric v. EPA*, in which a St. Louis Missouri electrical utility argued that its mandate to supply electricity came before any duty to clean the air, and that shutting it down could not have been a serious intent of Congress just to protect the diffuse public health concerns.

tree plantations, to produce renewable timber and sequester carbon dioxide. These and scores of readily available measures can be mandated; the environmental law techniques of “technology forcing” can be used to realize the Pacala and Socolow vision.

What prevents nations from embracing the Precautionary Principle? They often need procedures to do so. Again, environmental law provides procedures, such as the technique of Environmental Impact Assessment (EIA). Rio Principle 17 provides that “Environmental Impact Assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.” The EU, Canada and USA widely use advanced EIA techniques, but none yet apply them to reducing greenhouse gas emissions or sequestering gases. All States need to enact EIA laws and apply them with rigor. New York State is now preparing regulations to require EIA under the State Environmental Quality Review Act (SEQRA)<sup>25</sup> to address climate change. State such as those in the ASEAN region should take the lead in developing advanced EIA to cope with sea level rise and ensuring stable flows of energy, potable water, and other environmental infrastructure, given the region’s vast coastlines and the needs of its growing population. Can ASEAN afford to be less developed in its legal infrastructure than the EU or North America in this regard? ASEAN member States have the present capacity to enact and apply EIA far more extensively than is today done.

## 5. Legal Precedents for More Effective Climate Change Regimes

The climate change debates, and Kyoto Protocol negotiations, are less effective than they might be because they are premised on a false assumption that nations can address climate change slowly, and as just one of their many priorities. Indeed, as a new and little understood priority (high level officials who should know better still like jokes about

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<sup>25</sup> Article 8 of the NY Environmental Conservation Law.

“global warming”), few States have cabinet level offices of climate change just as few have cabinet level offices for environmental quality assurance. Lacking a focal point and a way to access the highest levels of government, the response to climate disruption is relegated to low levels of government. Even with its continuing disasters in New Orleans and the Coast of the Gulf of Mexico, for instance, the USA federal government has made no effective effort to better prepare to cope with the effects of climate disruption.

If States were to take their UNFCCC obligations seriously, they would model the next post-Kyoto agreements one or two precedents. The first is Agenda 21, adopted at the Rio Earth Summit. Its many prescriptions would both advance sustainable development and reduce greenhouse gases. However, as the Johannesburg Plan of Implementation<sup>26</sup> sadly showed in 2002, far too little is done to implement Agenda 21 by most UN agencies and most States. Since the States are responsible for the UN agencies, the deficit in action returns to the leadership in each national capitol. If States embraced Rio Principle 10, on public participation, the public could press leaders to do more to cope with climate change; lacking means for public participation in environmental decision-making, this does not happen. Above all, the multi-sectoral and inter-dependent design of sustainable development objectives in Agenda 21 needs to be brought to the climate change negotiations. As Pacala and Socolow demonstrate, one sector (e.g. greenhouse gas trading systems, even with clean development mechanisms attached) is too limited to have meet the obligations of Article 4 of the UNFCCC.

Second, and more focused, is the model of the Vienna Convention for the Protection of the Stratospheric Ozone Layer,<sup>27</sup> with its Montreal Protocol and the London,<sup>28</sup> Copenhagen and Beijing accords. Under this treaty system, one potent class of greenhouse gases, the “ozone depleting substances” such as chlorofluorocarbons (CFCs), have been

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<sup>26</sup> [http://www.environment.gov.za/nssd\\_2005/Web/Introduction%20and%20Background/JPOI\\_Response\\_Strategy\\_2003.pdf](http://www.environment.gov.za/nssd_2005/Web/Introduction%20and%20Background/JPOI_Response_Strategy_2003.pdf)

<sup>27</sup> <http://sedac.ciesin.org/entri/texts/vienna.ozone.layer.protection.1985.html>

<sup>28</sup> <http://sedac.ciesin.org/entri/texts/montreal.protocol.ozone.amend.1990.html>

reduced enormously across all developing and developed nations. By banning uses and banning trade (indeed, if a nation trades in CFCs outside the treaty system, all States agree to cut off all trade with such a nation). Nations have created national focal points and agreed in a reporting system and established a non-compliance review to help States come into compliance with targets and time-tables. Capacity building measures have been employed, and international cooperation is the fundamental norm informing the system, rather than assessing blame and taxing for costs.

Why is the Vienna Convention so helpful? It shows that States can reduce and replace greenhouse gas emissions effectively, albeit in one sector. More must be done to protect the stratospheric ozone, which is still degrading, and even when legacy CFCs are no longer being released into the atmosphere it will take a decade for the CFCs to reach the stratosphere, so we must wait and hope that Earth's natural systems will re-stabilize the stratospheric ozone layer that protects life on earth from the harmful extreme ultraviolet solar radiation.

Nations need to adopt a model such as that for ODS. There will be immediate cut-backs by everyone; the larger emitters will need to do more than the smaller emitters, but everyone must engage in a pervasive retooling of how human economic activity works. A model to be adopted is the ISO-14000 pattern, where industry designs systems to do so and is certified as meeting those systems. This approach should apply to agriculture, forestry, urban transportation, etc. An analogue would be the use of design specifications; all cities should adopt green building codes, and nations manufacturing or importing new motor vehicles should require that more than fuel efficiency standards. They should follow the precedent of the Vienna Convention and restructure the product entirely. States should mandate that the product be built without internal combustion engines, by a target year, and ban all use or export of used cars. International aid to assist developing nations import and use only clean motor vehicles would follow.

Most national leaders, whether parliamentary, executive or diplomatic, do not believe that there is the sort of urgency that States brought to the stratospheric ozone hole, as there is to climate disruption.

The road to the UNFCCC COP in Bali in December 2007, needs to set in place a multi-sectoral approach to coping with climate disruption. Every sector needs to form taskforces and teams to redesign the activities and products of each sector. This will, of course, unleash an era of rich creativity and innovation, and human ingenuity may indeed rise to the occasion. Certainly many will make new profits, and one need not assume that this will be negative to the overall economy. There will be losers and winners. But governments must maximize the space for the winners and keep the level playing field for all. This will mean helping the developing nations, who must import most of the technology and the products and practices.

At the recent UN General Assembly thematic debate on the Challenge of Climate Change,<sup>29</sup> Robert Socolow outlined a way to keep the emissions as of 2005 constant through 2055, and not increasing. Without stabilizing emissions, current expansion will let emissions grow from 7 billion tons of carbon emitted per year (GtC/y) to 14 GtC/y. He would replace carbon as a fuel, and supply energy from other sources. To hold global emissions flat, the OECD today must cut-back emissions on a magnitude of 4 GtC/y, and this would allow the non-OECD nations to continue to emit as they develop economically and reduce their own emissions on the magnitude of 2 GtC/y.<sup>30</sup>

For the UN General Assembly debate, Socolow computed the per-capita carbon distributions of five classifications of nations. The OECD accounted for 45% of carbon emissions, with its 3 billion resident people. The non-OECD nations had 5 billion people, and 55% of the emissions. However, the per capital emissions from the least developed non-OECD nations were negligible; to require them to

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<sup>29</sup> See the debate at [www.un.org/ga/president/61](http://www.un.org/ga/president/61) and the Program for the Thematic Debate on the Challenge of Climate Change, 31 July 2007. Socolow's statement, and that of other experts, is found on the first day; the statements of UN Member States and Observer Missions are on the next two days, 1–2 August 2007.

<sup>30</sup> See Socolow and Pacala, "A Plan to Keep Carbon in Check," *Scientific American*, September 2006, pp. 50–57, at p. 56.

contribute to large cut-backs when they have urgent development needs just in order to cope with the effects of climate change, would not be productive nor workable.

Socolow suggested that to avoid the coming “environmental havoc” from the effects of climate change, the developed nations should focus on their adaptation and mitigation and help the developing states with their adaptation. A division of labor is needed, and keeping with the broad reading of “common but differentiated” responsibilities. Socolow’s per capital approach, rather than an approach based in sovereign equality of states, makes sense. He re-characterizes nations in terms of those who must take the lead and those that need some capacity building. He suggests that for the least developed nations, there is no gain to be had in requiring cut-backs in climate emissions because they are so small, and these states need to meet urgent sustainable development objectives if their civilizations are to continue. For these states, all other states should lend as helping hand.

If the negotiations between 2007 and 2012 take this broader view, there are many ways that States could promote an Agenda 21/Climate Adaptation program for all nations, while promoting new economic models that the developed nations would have to fashion for themselves and for the benefit of all economies. In a “flat earth” these benefits can be exported and imported rapidly. For instance, the imposition of a small transfer fee in the movement of oil, gas and coal across borders, paid into an international fund for adaptation, could finance extensive investments in building climate adaptation systems for the poorest nations. This would allow pervasive macro-economic reform. The problem with ETS and the clean development mechanisms is that they are micro-reform techniques and only states with well developed governmental infrastructures can take advantage of them. Most small island states might never see such CDM projects.

The United Nations system also needs to do more for climate change. Every specialized agency and every MEA needs to develop a climate change model, and assume some of the adaptation burden. This cannot be done through the UNFCCC COP alone. States

made clear this year that they do not want climate change assigned to the Security Council, since every State wants to be a decision-maker. They accept the UNFCCC COP as a forum, but they also accept the UN General Assembly as a forum. Some consensus on the focal point for international cooperation on climate change will be needed.

Indeed, a system-wide approach to climate change is needed. Perhaps the UN should establish a Climate Council, taking over the chamber of the Trusteeship Council; this is where the August 2007 UNGA thematic debate on climate change was held, rather than in the UNGA Hall. All inter-agency cooperation needs to have a climate change focus also. Without a system-wide approach, it is likely that needed reforms cannot be mobilized in time to avert a worsening of climate disruption. Chief among the MEAs in this regard is the Convention on Biological Diversity (CBD). The CBD needs to be given the task to marshal the human support to sustain and expand sequestration systems for forests and wetlands and marine biota. If this is done with integrity, the transparent rigor of scientific disciplines, and with respect for the other ecosystems and their life forms, then the CBD can help fashion ways to ensure both continuation of biodiversity and a maximization of green-house gas sequestration.

While carbon trading will surely become a global system,<sup>31</sup> it is essential that it not be seen as a panacea or even a dispositive step toward coping with climate change. It is a fledgling preliminary expression of concern that action must now come. Its weaknesses need to be understood. We need not only compensate for the less developed nations, which cannot easily reduce emissions; we must also compensate for the releases of greenhouse gases from melting tundra, and other natural sources, such as forest fires. OECD nations must compensate for far more than just their own past, present or future emissions.

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<sup>31</sup> See, for instance, the robust systems already in place. J. Robinson, J. Barton, C. Dodwell, M. Heydon and L. Milton, *Climate Change Law: Emission Trading in the EU and UK* (Cameron May, 2006).

The global economy requires a major roll-back in emissions and a major effort to sequester carbon. Instead of making this the highest priority, the tentative post-Kyoto negotiations defer tough decisions, and nations domestically are at work on increasing supply side with manufacture and trading in biofuels or developing trading in emission reduction objectives, or “credits,” in order to use the market to achieve mitigation of emissions. Some attraction of the credit trading is to divert funding into socio-economic development or even efforts at elimination of poverty. Yet the lion’s share of all work goes into design of emission trading; major financial centers vie to become the trading capitals of these credits, and secure the wealth from the transactions that will take place. The euphoria of a consumer society attracts us to emission trading schemes; we would do well to go back to school with the IPCC and look at what else we need to address. We invest time and concern for carbon markets, but both the public and the private sector are investing vastly less time and concern in examining how the Convention on Biological Diversity can ensure that sequestration will be sustainable.

## **6. Institutional Dysfunctionality**

What this paper outlines is dysfunction in the international and national legal systems. International Law — and all legal systems and their norms — evolved at times in which natural conditions around the Earth were relatively stable. We assumed that the Earth would accommodate us, and paid little attention to understanding how Earth’s systems worked. Our assumption of the endless bounty of nature was naïve and uninformed. As natural resources became compromised through over use, the conservation movement was founded, the first wildlife laws were enacted, and in 1948 the International Union for the Conservation of Nature and Natural Resources was established. As pollution grew, the environmental movement was born and pollution control and environmental laws emerged, and UNEP was established. At the end of the 20th century, States came to recognize that carbon based fuels

(coal, oil and gas) were becoming scarce and thus more expensive as energy sources, and laws for energy efficiency were enacted. However, at the foundation of each of these efforts was the motivation to continue business as usual, to sustain a yield in flora and fauna that could be harvested and to trade and consume what humans wished to use.

These traditional conservation and environmental objectives are no longer sufficient. Adaptation and building robust capacity for Earth's natural systems to adapt to the changing conditions of life on Earth is the new mission. Human activity has constrained natural systems and weakened the capability of flora and fauna to adapt. Evolution and natural selection is a powerful force in nature and humans need to give it its widest latitude to sustain biological diversity and conditions amicable to the human species.

If one basic objective of law is to stabilize conditions and ensure that traditional and established practices of commerce, culture, social order can function "as usual," then we need to build into this strong legal order the procedures to accommodate change and evolution. We need to re-establish law reform commissions, which many nations have allowed to fall into disuse or have outright abolished. We need to re-establish technology assessment and risk-assessment procedures, and above all widen the use of EIA.

Another basic objective of law is to attain justice. Climate disruption will harm rich and poor alike, and create new conditions of social injustice. Law reform will be needed to address the resulting social inequities or harms. Historically, law has done more to bolster the established order than it has functioned to redress unjust conditions. The abolition of slavery or the extension of suffrage to women or the labor reforms still being advanced by the UN International Labour Office, are examples of how the law has redressed broad social wrongs. Those of us who claim to understand the ameliorative functions of justice and law must now build on these precedents to align a new era of adaptive environmental laws to cope with climatic disruptions.

This task is not easy, but it is the over-arching task for the coming several generations of humans, and must become the

over-arching mission of legal education. Perhaps we need to take a leaf from the International Labour Organization's (ILO) experience; the ILO delegations are made up of labor union, industrial and commerce and government ministerial representatives. For climate negotiations, we might want to consider shaping our national delegations to climate negotiations to have at least 4 sectors represented on each delegation: a qualified scientific delegate, an executive branch focal point delegate, an economic sector delegate (commerce, industry or agriculture, as appropriate), and delegate representing social and environmental concerns NGOs (Non-Governmental Organizations). These stakeholders are the ones who will help make adaptation to climate change effective, or not.

## 7. Epilogue

The task for Asia and the world on the road to Bali in December is to make adaptation to climate disruption the high and all-encompassing priority that it must become. If States address short term and narrowly focused interests, such as who gets what benefit from what emission trading or development project, all they do is delay the day when effective international cooperation will begin in the effort to stabilize the Earth's atmospheric and climatic conditions.

It is likely, in the short term, that every social reform movement will try to gain some leverage or tactical advantage by embracing a role in coping with climate change. Women's movements will (rightly) say women are at risk and if their needs are met, they can do much to help adapt to climate change. The military will show how energy efficiency can be built into aircraft, ships or tanks. Lobbyists for each commodity will position their economic clients to come out ahead in the jockeying for a climate change advantage. As existing sectors behave in this way, all sectors tend to discount the real urgency of helping the small island states such as, Bangladesh and delta states, whose territory is vanishing. These tragic developments are not merely a competing for resources or reforms; they are of a different magnitude. The effects of climate disruption rob people in some

places of their shelter, their livelihood, their culture and ultimately their lives.

ASEAN and other regions need to unite to build their regional systems for climate adaptation, and to position their economies to participate in climate mitigation by removing greenhouse gases from the atmosphere. The road to Bali and 2012 should not mask the need to take urgent action today. A nation, or regional group of nations, that takes the lead in adapting to the conditions of climate disruption will be a winner; those who wait for the UN or for the international community to attain a final consensus on a course of action, will be losers.

Earth and human civilization are at the beginning of a new era, a kind of paradigm shift, whether we like it or not. We are all New Orleans, not yet back on its feet two years after the hurricanes and disaster in 2005. We are all a small island state, for which climate change is an existential challenge: adapt and cope and strive to sustain a civilization or it will be one with the fabled *Atlantis*. Local authorities are the “front lines” in coping with climate disruption, and they need to deploy local environmental law tools such as Integrated Coastal Management (ICZM) now. New wetlands must be designed and accommodated as old ones are flooded and eroded; coastal infrastructure needs to be relocated and buffered. While each such step seems mundane and not worthy of being a high matter of states, in fact helping each wetland adapt or sustaining each old growth forest or each tree for afforestation is of transcendental importance.

In short, the common concern of the atmosphere, whether in the stratospheric ozone or the climate dimensions, require all states to act in solidarity. This is not a choice, it is a necessity. To act in solidarity, however, requires each state to mobilize all of its own domestic economic and social sectors to address adaptation to the effects of climate disruption, and the removal of billions of tons of gaseous carbon from the atmosphere for the next 3–4 decades. If local authorities in many areas can eliminate cigarette smoking in one generation, individuals can embrace reuse, recycle and restore activities in their personal lives. To facilitate community-wide reforms, national action plans with the

force of law will be needed. While acting locally, states must also act globally. New measures to cooperate on assisting migration of ecological refugees must be built, as must means to prevent and combat forest fires. All the global sectors of this “flat Earth” need to begin to work in tandem to retool, reinvent and re-imagine their roles. The profits from this retooling will be real, unlike the ephemeral and transitory fees gained from the transaction costs in managing transfers of emission credits.

These efforts will open a new kind of political space in international cooperation. The calls by France for a new UN environmental agency may enter this space, and a new system-wide climate focus can reinvigorate international cooperation. Without a world-wide effort addressed to removing carbon from the atmosphere, one can easily envision a range of environmental tragedies and human rights disasters and economic defaults. Sustainable development will be set back. To avert such a future, intergovernmental cooperation should facilitate a mobilization of public/private activity on the scale of the efforts of World War II, only this time for civilian and peaceful objectives.

Mobilization of such resources has been advocated before, as in the UN Millennium Objectives to eradicate poverty. The response to such calls is dismal. States thought that they could choose to ignore or use the recommendations of Agenda 21; development would come sooner or later. Climate disruption renders this “business as usual” approach obsolete. The effects of climate change are not a classic “externality” in which a polluting state transfers the cost of its waste to the receiving state. Earth has only one atmosphere, and we shall all experience climate disruption at one time or another. Historic pathways for hurricanes and typhoons can change; traditional patterns of rainfall relied upon for generations can change. Human mistakes, such as the desiccation of the Aral Sea, can get worse as the remnant waters in the Sea’s tributaries dry up, as Central Asia’s glaciers melt. Endangered fish stocks fall as already threatened coral reefs are covered with deeper waters.

Either we mobilize reforms across all sectors, or all locations and sectors will pay the costs of this neglect. Past generations did not

understand what harm they did when they released carbon into the atmosphere. Although all too gradually they came to understand the harm of clear-cutting the forests, those who continue this vice think of themselves as creating wealth, not causing a problem. The present generation is the age that for the first time understands what humans have done to the atmosphere of the Earth, to its oceans to its flora and fauna and ecosystems. It is the future generations that will judge how we rise to this challenge. Our generations cradle babes in our arms, and needs to muster all the talent for parenting we can, to be worth of the child's trust in us.