

# CLIMATE CHANGE AND DEVELOPING COUNTRIES: THE INTERNATIONAL LAW PERSPECTIVE

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I.	THE CHALLENGE OF CLIMATE CHANGE .....	539
II.	IMPACT ON DEVELOPING COUNTRIES .....	543
III.	ADDRESSING GLOBAL WARMING AND THE DEVELOPING COUNTRIES' CONCERNS AND NEEDS: AN INTERNATIONAL LAW PERSPECTIVE .....	545
	A. <i>Addressing Global Warming</i> .....	545
	B. <i>Addressing the Developing Countries' Concerns and Needs Under the Climate Convention and the Kyoto Protocol</i> .....	551
	1. General .....	551
	2. The Clean Development Mechanism .....	552
	3. Other Assistance to Developing Countries .....	555
V.	CONCLUSION .....	556

## I. THE CHALLENGE OF CLIMATE CHANGE

A broad scientific consensus exists that climate change is real and the amount and rate of change have accelerated; the only uncertainty is about the political will of the international community to take effective measures to combat it. In November 2007 the Intergovernmental Panel on Climate Change (IPCC) unequivocally concluded that atmospheric concentrations of four long-lived greenhouse gases (GHGs)—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and halocarbons (a group of gases containing fluorine, chlorine, or bromine)—have significantly increased globally as a result of human activities since the Industrial Revolution.<sup>1</sup> The IPCC, established through a collaboration of the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), comprises an international group of scientists, who stated with more than sixty-six percent assessed probability of occurrence that agricultural

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1. IPCC, *Climate Change 2007: Synthesis Report*, 37, available at [www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf) (last visited Mar., 10, 2010). This was the IPCC's Fourth Assessment Report.

activities, fossil fuel use, and land-use change are primarily responsible for this change. Also, advancements since 2001, when the IPCC issued its last assessment report, show that the human impact extends beyond average temperature to temperature extremes and wind patterns.<sup>2</sup>

For example, in October 2008, a report to the government of Australia predicted that CO<sub>2</sub> emissions will continue to rise by more than three percent per year until 2030.<sup>3</sup> This contrasts with the IPCC's worst-case scenario—that global CO<sub>2</sub> levels would rise by more than two percent per year; a growth rate of two percent is the IPCC's median scenario, on which most government projections are based. New research published since the release of IPCC's 2007 report paints a bleaker picture of the planet's environment.

Subsequently, the 2009 UNEP Yearbook warned: "The changing climate is pushing many Earth systems towards critical thresholds that will alter regional and global environmental balances and threaten stability at multiple scales. Alarmingly, we may have already passed tipping points that are irreversible within the time span of our current civilization."<sup>4</sup>

This report notes that ice melt in the Arctic, the Antarctic, and Greenland is much worse than the IPCC had projected, and that it is formally to be attributed to human influence. It states that researchers used place-specific gridded data sets and simulations from four different climate models, concluding that "human activities have already caused significant warming in both polar regions with likely consequences for indigenous communities, biological systems, ice-sheet mass balance, and global sea levels."<sup>5</sup> Citing a 2008 Nansen Environmental and Remote Sensing Center study, the report states:

For the second year in a row, there was an ice-free channel in the Northwest Passage through the islands of northern Canada. But this year also saw the opening of the Northern Sea Route along the Arctic Siberian coast. The two passages have probably not been open simultaneously since before the last ice age, some

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2. *Id.* at 40.

3. Ross Garnaut, *Australian Stern Review* (Oct. 27, 2008), available at <http://www.garnautreview.org.au/index.htm#pdf> (last visited Mar., 10, 2010).

4. UNEP Yearbook 2009, *New Science and Developments in Our Changing Environment 21* (2009) [hereinafter *UNEP Yearbook 2009*], available at [http://www.unep.org/geo/yearbook/yb2009/PDF/UNEP\\_Year\\_Book\\_2008\\_EN\\_Full.pdf](http://www.unep.org/geo/yearbook/yb2009/PDF/UNEP_Year_Book_2008_EN_Full.pdf) (last visited Mar. 10, 2010).

5. *Id.* at 22.

100,000 years ago . . . . Theoretically, in 2008 the Arctic ice cap could have been circumnavigated.<sup>6</sup>

As to the Greenland and Antarctica ice sheet loss, the report cites a 2008 study stating that “[n]ew findings in 2008 revealed that the flow into the ocean of the Jakobshavn and Isbrae glacier in western Greenland, one of the most important routes for ice loss, has doubled since 1997.”<sup>7</sup> The European Space Agency reported in April 2009 on the risk of the ice bridge supporting the Wilkins Ice Shelf, which connects it to the Charcot and Latady Islands, partly breaking away from the Antarctic Peninsula.<sup>8</sup> Another NASA study reported in January 2009 that West Antarctica is now also warming, according to a climate researcher at the University of Washington in Seattle who led the study.<sup>9</sup>

A disturbing scenario is the potential for the physical breakup of the ice sheets of Greenland and Antarctica, which could result in the rise of global sea levels to far exceed the last IPCC assessment forecast of up to sixty centimeters by 2100. What if the sea level were to rise by one meter by the end of the century? It would certainly create havoc globally for coastal states, as the Maldives, along with Kiribati and Tuvalu in the Pacific and the island of Sunderbans in the Bay of Bengal, would be submerged. And, as the U.N. High Commissioner for Refugees has observed:

Sinking island states present one of the most dramatic scenarios of the impact of climate change. The entire populations of low-lying States such as the Maldives, Tuvalu, Kiribati and the Marshall Islands may in future be obliged to leave their own country as a result of climate change. Moreover, the existence of

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6. *Id.* An April 2009 study by NASA scientists confirmed this finding by reporting that “ice cover on the North Pole is shrinking and getting thinner, too. That’s both a sign and a cause of continued rising temperatures . . . .” See Keith Johnson, *Ice, Ice Maybe: NASA Reports Greater Arctic Ice Melt*, Wall St. Journal (wsj.com), Apr. 6, 2009. A similar result was also revealed in a 2008 study by the European Space Agency. European Space Agency, *Arctic ice on the verge of another all-time low*, 28 August 2008, available at [http://www.esa.int/esaCP/SEMCKXOSAKF\\_index\\_2.html](http://www.esa.int/esaCP/SEMCKXOSAKF_index_2.html) (last visited Mar. 12, 2010).

7. UNEP Yearbook 2009, *supra* note 4, at 23.

8. European Space Agency, *Collapse of the ice bridge supporting Wilkins Ice Shelf appears imminent*, 3 April 2009, available at [http://www.esa.int/esaCP/SEMDO7EHITF\\_index\\_2.html](http://www.esa.int/esaCP/SEMDO7EHITF_index_2.html) (last visited Mar. 10, 2010).

9. NASA, *Satellites Confirm Half-Century of West Antarctic Warming*, Jan. 1, 2009, available at [www.nasa.gov/tpics/earth/features/warming\\_antarctica.html](http://www.nasa.gov/tpics/earth/features/warming_antarctica.html). (last visited Mar. 12 2010).

their State as such may be threatened. Entire populations of affected states could thus become stateless.<sup>10</sup>

Based upon research since the IPCC Assessment Forecast, UNEP states that a much larger rise is possible and indeed probable. It cites several studies predicting a rise between 0.8 and 1.5 meters as the likely outcome by the end of this century, which would displace around 100 million people in Asia. The report concludes that:

[R]esearch in 2008 indicates that sea level rise—from thermal expansion, mountain glacier retreat, and ice sheet melt—is likely to be much greater and to arrive much sooner than believed even two years ago. No matter how quickly climate change is mitigated, sea level will rise. So, efforts to adapt to rising seas are more urgent than ever.<sup>11</sup>

Thus, the IPCC chairman, Dr. Rajendra K. Pachauri, has aptly called upon politicians to respond to new research showing that the sea level rise is likely to be far worse than the prior U.N. projections. “They should certainly respond to a worst-case scenario—even if there is only a small risk that it becomes reality—because it will have terrible consequences. It is quite common risk management.”<sup>12</sup>

Is all this potential adverse impact of climate change leading to disastrous consequences? The UNEP report is not sanguine. The following two statements are pertinent: 1) “[w]ith possibilities of collapsing ice sheets, methane bubbling out of permafrost, desiccated rainforest ecosystems, and sporadic ocean circulation patterns, concern is growing that Earth’s life-support systems are approaching thresholds that contain tipping points,”<sup>13</sup> and 2) citing two studies from the Proceedings of the National Academy of Sciences, the UNEP report concludes:

[T]he evidence suggests that we may be within a few years of crossing tipping points with potential to disrupt seasonal weather patterns that support the agriculture activities of half the human

10. U.N. High Commissioner for Refugees, Submission: *Climate Change and Statelessness: An Overview*, June 2009, available at <http://unfccc.ing/resource/docs/2009/mns/igo/048.pdf> (last visited Mar. 10, 2010).

11. UNEP Y.B. 2009, *supra* note 4, at 25.

12. Rajendra K. Pachauri, *IPCC-Chairman to politicians: Respond to worst-case scenarios—head of the U.N.’s Intergovernmental Panel on Climate Change urges politicians to respond to new scientific climate research*, Mar. 3, 2009, available at <http://en.cop15.dk/news/view+news?newsid=868> (last visited Mar. 12 2010).

13. UNEP Y.B. 2009, *supra* note 4, at 28.

population, diminished carbon sinks in the oceans and on land, and destabilize major ice sheets that could introduce unanticipated rates of sea level rise within the 21st century.<sup>14</sup>

If humanity faces dire consequences unless it resolutely acts to take effective mitigation actions and to undertake appropriate adaptation measures, why has there been such reluctance and resistance to do so? Obviously, there is not the political will to act firmly, notwithstanding the urgency. There is a sharp divide between the developed and developing countries on how to operationalize the “common but differentiated responsibilities” principle. Developing countries demand that major industrialized nations, which have primarily caused the problem, commit to steep cuts in carbon emissions in the short term and provide the necessary resources and technology so that countries without the wherewithal to undertake mitigation and adaptation measures are able to participate in the solution to this crisis. Many developed countries, on the other hand, seek firm commitments and timetables from the developing countries, without which, they argue, no international agreement can be reached.

## II. IMPACT ON DEVELOPING COUNTRIES

All indications are that the brunt of the adverse impacts of global climate change will be felt hardest by some of the poorest and most vulnerable communities, which have already begun to suffer from its effects. Kemal Dervis, Administrator of the United Nations Development Program (UNDP) and Achim Steiner, UNEP Executive Director, make the point in UNDP’s Human Development Report 2007–2008: “The effect that increased droughts, extreme weather events, tropical storms and sea level rises will have on large parts of Africa, on many small island states and coastal zones will be inflicted in our lifetimes . . . . [F]or some of the world’s poorest people, the consequences could be apocalyptic.”<sup>15</sup>

They add, “[i]n the long run climate change is a massive threat to human development and in some places it is already undermining the international community’s efforts to reduce extreme poverty.”<sup>16</sup>

The UNDP Report’s message is clear:

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14. *Id.* at 29.

15. UNDP, *Human Development Report 2007–2008—Fighting Climate Change: Human Solidarity in a Divided World*, at v (2008).

16. *Id.*

The early warning signs are already visible. Today, we are witnessing at first hand what could be the onset of major human development reversal in our lifetime. Across developing countries, millions of the world's poorest people are already being forced to cope with the impacts of climate change . . . . [I]ncreased exposure to drought, to more intense storms, to floods and environmental stress is holding back the efforts of the world's poor to build a better life for themselves and their children.<sup>17</sup>

The Report warns that climate change could lead to "ecological catastrophes" as we are edging toward "tipping points."<sup>18</sup> The outcome could be that the Millennium Development Goals<sup>19</sup> will not be met, which, in effect, means that the world's poor would not be able to satisfy their basic human needs and hence would suffer from widespread violation of their fundamental human rights enshrined in the International Covenant on Economic, Social and Cultural Rights.<sup>20</sup>

The nature of future impacts on developing countries is brought to the world's attention by Working Group II of the IPCC's Fourth Assessment Report. According to the report, between 75 million and 250 million people in Africa are projected to suffer increased water stress caused by climate change by 2020.<sup>21</sup> It is also projected that agricultural production, including access to food, will be severely compromised in many African countries, which will adversely affect food security and exacerbate malnutrition, and that the sea level will rise, affecting low-lying coastal areas with large populations.<sup>22</sup> The report further projects that in Asia glaciers will melt and recede in the Himalayas, which will increase flooding and affect water resources within the next two to three decades. Consequently, more than a billion people could be adversely affected by the 2050s because of the projected decrease of freshwater availability due to climate change, which also will cause an increase in deadly diseases.<sup>23</sup>

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17. *Id.* at 1.

18. *Id.* at 2.

19. U.N., *The Millennium Development Goals Report* (2009).

20. International Covenant on Economic, Social and Cultural Rights, concluded at New York, Dec. 16, 1966, entered into force January 3, 1976, 993 U.N.T.S. 3, reprinted in 6 I.L.M. 36 (1967).

21. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for Policy Makers, at 13, Apr. 2007, available at <http://www.ipcc-wg2.org> [hereinafter Working Group II].

22. *Id.*

23. *Id.*

As to the impact of global warming on Latin America, the report projects that there will be a risk of significant biodiversity loss in many areas, increased risk of flooding in low-lying areas because of sea level rise, and significant adverse effect on water availability due to changes in precipitation patterns and the disappearance of glaciers.<sup>24</sup> The report notes that small islands located in the tropics or higher latitudes are especially vulnerable to the effects of climate change, extreme events, and sea level rise.<sup>25</sup> This could affect local resources such as fisheries, exacerbate inundation, storm surge, and erosion; by mid-century reduction of water resources on many small islands, such as those in the Caribbean and Pacific, will be such that they become insufficient to meet the population's demand during the periods of low rainfall.<sup>26</sup>

### III. ADDRESSING GLOBAL WARMING AND THE DEVELOPING COUNTRIES' CONCERNS AND NEEDS: AN INTERNATIONAL LAW PERSPECTIVE

#### A. Addressing Global Warming

How does international law respond to the problem of global warming? A starting point is Principle 21 of the Stockholm Declaration, which forms the basis for international law to address climate change and captures the tension between sovereignty and environmental protection:

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.<sup>27</sup>

Also pertinent is the concept of state responsibility developed by the United Nations International Law Commission (ILC) in its Draft Articles on State Responsibility, under which responsibility does require fault,<sup>28</sup> that is, a wrongful act or negligence.

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24. *Id.* at 14.

25. *Id.* at 15.

26. Working Group II, *supra* note 21, at 15.

27. Stockholm Declaration of the U.N. Conference on the Human Environment, June 16, 1972, Princ. 21, U.N. Doc. A/CONF.48/14/Rev.1, at 3 (1973), U.N. Doc. A/CONF.48/14, at 2-65 and Corr. 1 (1972), 11 I.L.M. 1416 (1972).

28. U.N. GAOR, 48th Sess., Supp. No 10, at 125, U.N. Doc. A/51/10 (1996).

Subsequently, the ILC addressed environmental harm that is unintentional or occurs despite due diligence by establishing a parallel basis for remedies when there is no fault. The ILC called it “state liability” and gave it the title “Draft Articles on International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law.”<sup>29</sup> Thus, we have two alternative jurisprudential bases for rectifying harms to the environment: 1) fault-based responsibility, and 2) no-fault (strict or absolute) “liability.” The latter means that a state act could give rise to liability even if it did not violate international environmental law.

For at least the following five reasons, the “no harm” rule embodied in Principle 21 of the Stockholm Declaration, is, however, inadequate to address the climate change problem. First, it is not easy to trace climate change sources and to measure them since they are widespread. Consequently, it will be a formidable task to allocate responsibility among states because it is often their combined activities that cause climate change. Second, while Principle 21 aims at balancing a state’s responsibility to avoid harming other nations with its right to exploit its environment, many developing nations consider the latter right as their right to economic development, and thus as their priority concern taking precedence over their abstract responsibility to the international community. Third, allocation of responsibility is well-nigh impossible because of the time lag between GHG emissions and their adverse effects. Fourth, few developing countries have the wherewithal to find alternatives to fossil fuels on which they are highly dependent. Thus applying the principles of common but differentiated responsibilities and intragenerational equity assumes a central role as we explore the means to respond to climate change. Finally, monetary damages are obviously not an adequate remedy once the damage is done.

The Special Rapporteur of the ILC’s Draft Articles on Liability put it well when he stated that the liability approach is premised on state obligations, which presuppose “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.”<sup>30</sup>

That is why neither the Principle 21 approach nor the ILC’s liability approach is workable. Instead, the focus has to be on international cooperation and prevention. This cooperation is reflected in the U.N.’s efforts to establish a multilateral treaty to address the challenge of climate change. After years of studies, followed by negotiations on an international

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29. U.N. GAOR, 44th Sess., Supp. No. 10, at 222, U.N. Doc. A/44/10 (1989).

30. U.N. GAOR, 43rd Sess., Supp. No. 10, at 24, U.N. Doc. A/43/10 (1988).

accord, in 1992 the U.N. adopted the Framework Convention on Climate Change<sup>31</sup> (Climate Convention), which recognized climate change as a serious threat and set an “ultimate objective [of achieving] stabilization of [GHGs] . . . at a level that would prevent dangerous anthropogenic interference with the climate system.”<sup>32</sup> The Convention established a goal of reducing GHG emissions to 1990 levels by the year 2000,<sup>33</sup> but provided no concrete targets or timeframe for achieving that goal. Instead, it deferred development of any binding state targets and timetables for a later protocol.

Five years later, in 1997, at the Third Conference of the Parties to the Climate Convention (COP), held in Kyoto, Japan, the parties signed the Kyoto Protocol,<sup>34</sup> which was created as a framework for future action. The Protocol advanced the implementation process envisaged in the Climate Convention as it included commitments by specified developed countries to reduce GHGs, averaging 5.2 percent below the benchmark 1990 concentration levels by the 2008–2012 period.<sup>35</sup> It also included commitments by the developing countries and introduced market-based “flexibility mechanisms” for implementation, which will be detailed later.

Selected developments since the Kyoto COP will be highlighted here. In 1998 in Buenos Aires, the Parties adopted a “Plan of Action,” setting out a program of work on the operational details of the Kyoto Protocol.<sup>36</sup> In 2001, the parties adopted the “Bonn Agreements,” aimed at completing key issues under the Buenos Aires Plan of Action,<sup>37</sup> and subsequently at Marrakesh<sup>38</sup> the signatories to the Climate Convention agreed on rules for implementing the Kyoto Protocol, which came into force on February 15,

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31. United Nations Framework Convention on Climate Change, May 9, 1992, 31 I.L.M. 849 (1992), available at [www.unfccc.de/resource/convkp.html](http://www.unfccc.de/resource/convkp.html) (last visited Mar. 12, 2010) [hereinafter Climate Convention].

32. *Id.* art 2.

33. *Id.* art 4(2)(a), (b).

34. Framework Convention on Climate Change, Kyoto, Jap., Dec. 11, 1997, *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, arts. 6, 17, U.N. FCCC/CP/1997/7/Add.2, reprinted in 37 I.L.M. 22 (1998), available at [www.unfccc.de/resource/confkp.html](http://www.unfccc.de/resource/confkp.html) (last visited Mar. 12, 2010) [hereinafter Kyoto Protocol].

35. *Id.* art. 3(1), Annex B.

36. See United Nations Framework Convention on Climate Change, Conference of the Parties, Buenos Aires, Argentina, Nov. 2–14, 1998, *Report of the Conference of the Parties, on its Fourth Session*, U.N. Doc. FCCC/CP/1998/16/Add.1 (1999), available at [www.unfccc.int/resource/process/components/response/landmarks.html](http://www.unfccc.int/resource/process/components/response/landmarks.html) (last visited Mar. 13, 2010).

37. See *id.*

38. See *Report of the Conference of the Parties on its Seventh Session, held at Marrakesh from 21 October to 10 November, 2001*, U.N. Doc. FCCC/2001/13 (2002), available at [www.unfccc.int/resource.docs/cop7/13.pdf](http://www.unfccc.int/resource.docs/cop7/13.pdf) (last visited Mar. 12, 2010).

2005.<sup>39</sup> At Marrakesh, a decision was also undertaken to establish an Adaptation Fund “to finance concrete adaptation projects and programmes in developing country Parties that are Parties to the Protocol, as well as [other specifically identified] activities.”<sup>40</sup> It was also agreed that the Adaptation Fund “shall be financed from the share of proceeds on the clean development mechanism project activities and other sources of funding.”<sup>41</sup> The Fund is governed by a board under the direction of the State Parties to the Protocol.

Further, meetings of the COP and the Conference of the Parties, serving as the meeting of the Parties to the Kyoto Protocol (COMP), were held in 2005 in Montreal,<sup>42</sup> 2006 in Nairobi,<sup>43</sup> and in 2007 in Bali,<sup>44</sup> where the Bali Roadmap for future negotiations and the Bali Action Plan were adopted.<sup>45</sup>

The Parties took several initiatives at Bali.<sup>46</sup> They recognized that “deep cuts in global emissions will be required to achieve the ultimate objective of the Convention and emphasize[d] the urgency to address climate change as indicated in the [IPCC’s] Fourth Assessment Report.”<sup>47</sup> Key elements of the plan included the launching of a new negotiation process to be completed by the end of 2009 for adoption at the Climate Change Conference in Copenhagen. It is a two-track negotiating process, as the Parties established an Ad-Hoc Working Group on Long-Term Cooperative Action as a subsidiary body under the United Nations Framework Convention on Climate Control (UNFCCC) to conduct the process of negotiating an agreement by 2009 on measures to be undertaken by developed as well as developing country Parties to the Convention. The goal is to establish the Parties’ legally binding commitments beyond 2012,

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39. See [unfccc.int/meetings/unfccc\\_calendar/items/2655.php?id=397&out=detail](http://unfccc.int/meetings/unfccc_calendar/items/2655.php?id=397&out=detail) (last visited Mar. 12, 2010).

40. Marrakesh Accords, *supra* note 38, Add.1, Decision 10/CP.7, ¶ 1.

41. *Id.*

42. See U.N. Climate Change Conference, Nov. 25 to Dec. 9, 2005, Montreal Can., *COP 11 & CMP 1*, [unfccc.int/meetings/cop\\_11/items/3394.php](http://unfccc.int/meetings/cop_11/items/3394.php) (last visited Mar. 10, 2010).

43. See U.N. Climate Change Conference, Nov. 6–17, 2006, Nairobi, Kenya, *Nairobi 2006*, [unfccc.int/meetings/cop\\_12/items/3754.php](http://unfccc.int/meetings/cop_12/items/3754.php) (last visited Mar. 10, 2010).

44. See The U.N. Climate Change Conference in Bali, Indon., Dec. 3–14, 2007, [unfccc.int/meetings/cop\\_13/items/4049.php](http://unfccc.int/meetings/cop_13/items/4049.php) (last visited Mar. 10, 2010).

45. *Id.* Framework Convention on Climate Change, Bali, Indon., Dec. 3–15, Conference of the Parties, *Report of the Conference of the Parties on its Thirteenth Session, 1/CP.13*, U.N. Doc. FCCC/CP/2007/6/Add.1, at 3 (last visited Mar. 14, 2008) [hereinafter Bali Action Plan].

46. See generally Bali Action Plan, *supra* note 45, at 3–7.

47. *Id.* at 3.

when the first commitments to mitigate climate change under the Kyoto Protocol end.

[The Parties agreed on] a shared vision for long-term cooperative action, including a long-term goal for emissions reductions, to achieve the ultimate objective of the Convention, in accordance with . . . , in particular the principle of common but differentiated responsibilities and respective capabilities, and taking into account social and economic conditions and other relevant factors.<sup>48</sup>

On the actions to be considered for mitigation of climate change, the plan contains two separate paragraphs—one for developed country considerations and one for developing countries. For developed countries, the paragraph includes “[m]easurable, reportable and verifiable nationally appropriate mitigation commitments or actions,” and for developing countries, “[n]ationally appropriate mitigation actions . . . in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner.”<sup>49</sup>

Along with defining the scope and content of the review of the Kyoto Protocol, the Parties decided to take enhanced action on technology development and transfer, and financing of climate change action. The Parties also decided that the Adaptation Fund is to finance concrete adaptation projects and programs that are country-driven. The Parties at Bali took a major decision to include the reduction of emissions from deforestation and forest degradation as one of the considerations during the negotiations to follow Bali.<sup>50</sup> The Parties noted that “sustainable reduction in emissions from deforestation and forest degradation in developing countries requires stable and predictable availability of resources.”<sup>51</sup> The Program of Work is to be undertaken as related to “a range of policy approaches and positive incentives that aim to reduce emissions from deforestation and forest degradation in developing countries. . . .”<sup>52</sup>

Next, the Parties met in Poznań, Poland, from the first to the twelfth of December 2008.<sup>53</sup> The Ad Hoc Working Group, which had met at four sessions during 2008, reported that it had

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48. *Id.* ¶ 1(a).

49. *Id.* ¶ 1(b)(i)–(ii).

50. *Id.* at 8.

51. Bali Action Plan, *supra* note 45, at 8.

52. *Id.* at 9, para. 7.

53. The Parties agreed on a plan of action and programs of work for the year 2008–09 relating to future commitments and actions. Framework Convention on Climate Change, Poznan, Pol., Dec. 1–

considered all of the elements of the Bali Action Plan at each session, taking into account the interlinkages among them . . . [b]y addressing a shared vision for long-term cooperative action, enhanced action on adaptation and its associated means of implementation, enhanced action on mitigation and its associated means of implementation, and delivering on technology and financing, including consideration of institutional arrangements.<sup>54</sup>

At the meeting, the Working Group also reported the ideas and proposals presented by the Parties to it on these elements of the Bali Action Plan.<sup>55</sup> The Group's work program for 2009 includes producing a negotiating text in June.<sup>56</sup> Among other decisions, the Parties adopted rules of procedure of the Adaptation Fund Board and also its priorities, policies, and guidelines.<sup>57</sup> They also provided further guidance related to the Clean Development Mechanism.<sup>58</sup>

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12, 2008, Conference of the Parties, *Report of the Conference of the Parties on its Fourteenth Session*, ¶ 78, U.N. Doc. FCCC/CP/2008/7 (Mar. 19, 2009), available at [http://unfccc.int/meetings/cop\\_14/items/4481.php](http://unfccc.int/meetings/cop_14/items/4481.php) (last visited Mar. 10, 2010). The second review of the Kyoto Protocol under its Article 9, which requires a periodic review of the treaty in the light of the best available scientific information on climate change and its impacts, as well as pertinent technical, social, and economic information, took place there. The capacity of Parties to participate in the CDM was also reviewed.

54. Framework Convention on Climate Change, Poznan, Pol., Dec. 1–12, 2008, Ad Hoc Working Group on Long-Term Cooperative Action Under the Convention, *Report to the Conference of the Parties at its Fourteenth Session on Progress Made*, at 2, U.N. Doc. FCCC/AWGLTA/2008/L.11 (Dec. 10, 2008).

55. Framework Convention on Climate Change, Poznan, Pol., Dec. 1–10, 2008, Ad Hoc Working Group on Long-Term Cooperative Action Under the Convention, *Ideas and Proposals on Paragraph 1 of the Bali Action Plan*, U.N. Doc. FCCC/AWGLCA/2008/16/Rev.1 (Jan. 15, 2009).

56. Framework Convention on Climate Change, Poznan, Pol., Dec. 1–10, 2008, Ad Hoc Working Group on Long-Term Cooperative Action Under the Convention, *Work Programme for 2009*, U.N. Doc. FCCC/AWGLCA/2008/L.10 (Dec. 10, 2008).

57. Framework Convention on Climate Change, Kyoto, Jap., Report of the Adaptation Fund Board, Decision -/CMP.4 (advance unedited version), available at [unfccc.int/files/meetings/cop\\_14/application/pdf/cmp\\_af.pdf](http://unfccc.int/files/meetings/cop_14/application/pdf/cmp_af.pdf) (last visited Mar. 10, 2010). For the Board's report to the Parties, see Framework Convention on Climate Change, Copenhagen, Den., Dec. 7–18, 2009, Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, *Report of the Adaptation Fund Board*, at 5, U.N. Doc. FCCC/KP/CMP/2008/2 (Sept. 30, 2009).

58. Further guidance relating to the clean development mechanism, Decision -/CMP.4, available at [unfccc.int/files/meetings/cop\\_14/application/pdf/cmp\\_cdm.pdf](http://unfccc.int/files/meetings/cop_14/application/pdf/cmp_cdm.pdf). For the Annual report of the Executive Board of the clean development mechanism, see Framework Convention on Climate Change, Poznan, Pol., Dec. 1–12, 2008, Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, *Annual report of the Executive Board of the Clean Development Mechanism to the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol*, U.N. Doc. FCCC/KP/CMP/2008/4 (Nov. 14, 2008).

As mentioned earlier, the negotiation process launched in Bali is to be reviewed in Copenhagen in December 2009.

*B. Addressing the Developing Countries' Concerns and Needs Under the Climate Convention and the Kyoto Protocol*

1. General

First, developing countries are required to assume mitigation obligations, although the commitment is voluntary as no specific targets and timetables were set. Under Article 4, paragraph 1, of the Kyoto Protocol, all parties are to establish and report national programs which contain measures to mitigate climate change. Another provision of the Protocol reaffirms this obligation and further seeks to advance the implementation of the developing countries' commitments.<sup>59</sup> Second, the Protocol implicitly recognizes that developing countries are vulnerable to the adverse impacts of climate change as it requires developed countries to provide financial resources and transfer of technology to meet the developing countries' costs of implementing their obligations of emissions reduction.<sup>60</sup>

The Convention established the Global Environment Facility as the financial mechanism to fund developing countries' needs, which is also the entity of the financial mechanism of the Convention operating the Least Developed Countries Fund.<sup>61</sup> These Kyoto Protocol provisions reflect application of the principle of common-but-differentiated responsibilities. It should be emphasized that the developing countries' commitments under the Protocol are voluntary and contingent upon the developed countries' assistance. Also, the Adaptation Fund has been established to assist developing countries in their adaptation activities.

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59. Climate Convention, *supra* note 31, art. 10.

60. *Id.* art. 4(3). Under Article 4(7), implementation of developing countries' commitments depends upon the developed countries' funding and technology transfer.

61. Global Development Facility, <http://www.thegef.org> (last visited Mar. 10, 2010). The GEF is designed to fund developing countries' programs and projects that protect the global environment. Its programmatic focus is on: biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. The Parties provided further guidance for the operation of the Least Developed Countries Fund at the Poznan Conference. See Framework Convention on Climate Change, Poznan, Pol., Dec. 1–12, 2008, Conference of the Parties, *Report of the Global Environment Facility to the Conference of the Parties*, at 2, U.N. Doc. FCCC/CP/2008/2 (Dec. 19, 2008), available at <http://unfccc.int/resource/docs/2008/cop14/eng/02r01.pdf> (last visited Mar. 10, 2010).

## 2. The Clean Development Mechanism

One of the market-based flexibility approaches devised under the Kyoto Protocol is the Clean Development Mechanism (CDM).<sup>62</sup> The basic elements of the CDM are set out in Article 12 of the Kyoto Protocol and are further supplemented by the 2001 Marrakesh Accords,<sup>63</sup> which articulated how this mechanism works. The CDM Executive Board oversees the process under the direction of the State Parties to the Protocol.

The CDM is aimed at reducing carbon emissions. It operates by allowing Annex 1 countries (comprising industrialized countries that were members of the Organization for Economic Cooperation and Development in 1992, as well as countries transitioning from socialist economies, including Russia, the Ukraine, the Baltic States, and several Central and Eastern European states) to earn credits either by governments or private parties in these countries as they engage in project-based activities in developing countries to assist them in reducing their emissions. The credits they earn in developing countries are called “Certified Emissions Reductions” (CERs). CERs are measured in metric tons of CO<sub>2</sub> equivalent and can be sold to buyers in industrialized countries. The CDM Executive Board issues CERs, registers and validates projects, and manages several panels and working groups. Thus, the twin purposes of the CDM are: 1) to assist developing countries in achieving sustainable development, and 2) to allow Annex I countries flexibility in complying with their emissions reduction targets.

Electric power plants, wind-based power facilities, and afforestation and reforestation projects that reduce non-CO<sub>2</sub> industrial greenhouse gases illustrate CDM project activities. It should be specially noted that CDM emissions reductions are required to be supplemental to those that would have otherwise occurred without the project, and that a share of the proceeds from certified project activities is to be used to assist developing country parties to meet the cost of adaptation. It is also noteworthy that the only requirement on the part of the host government is that it must affirmatively endorse any CDM project occurring there.

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62. Besides the Bubble Agreement contained in its Article 4, the Kyoto Protocol established three mechanisms for extra-territorial emissions reductions—emissions trading (under Article 17 of the Protocol), joint implementation (under Article 6), and the CDM. Kyoto Protocol, *supra* note 34, arts. 6, 17.

63. Marrakesh Accords, U.N. Doc. FCCC/CP/2001/13/Add.2, Jan. 21, 2002, at 20–49.

Several potential benefits of the CDM include the reduction of GHGs, technology transfer to developing countries,<sup>64</sup> and help for developing countries in their adaptation activities since a percentage of transactions would be targeted for that purpose.<sup>65</sup> The cumulative effect is hoped to result in alleviation of poverty.

Although the CDM program was launched in November 2001, the first project was registered three years later, and the first CERs were issued in October 2005.<sup>66</sup> As of 16 October 2009, there were 1,860 registered CDM projects in fifty-eight countries, and approximately 2,900 further project activities are in the registration pipeline.<sup>67</sup> It is expected that the CDM will generate more than 2.7 billion tradable CERs when the first commitment of the Kyoto Protocol ends in 2012.<sup>68</sup> UNEP's Executive Director, Achim Steiner, stated in October 2007 that "100 billion dollars of funds are [estimated] to flow from the North to the South as a result of the Clean Development Mechanism."<sup>69</sup>

India (thirty-two percent of registered projects), China (nineteen percent), and Brazil (thirteen percent) have dominated the CDM activity.<sup>70</sup> A continuing shift in investment from developed to developing countries is in evidence, as the share of new investment has grown from thirteen percent (1.8 billion dollars) to twenty-three percent (26 billion dollars) in 2007, with China, India, and Brazil together accounting for eighty-two percent of

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64. For a report on analysis of technology transfer in CDM projects, see Stephen Seres, *et al.*, *Analysis of Technology Transfer in CDM Projects*, Dec. 2008, available at <http://cdm.unfccc.int/Reference/Reports/TTreport/report1207.pdf> (last visited Mar. 10, 2010).

65. Climate Convention, *supra* note 31, art. 4.

66. *An Overview of our Changing Environment*, 2008 U.N. Env't. Prog. Y.B. 25, U.N. Doc. UNEP/GCSS/X/INF/2.

67. Framework Convention on Climate Change, Copenhagen, Den., Dec. 7–18, 2009, Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, *Annual Report of the Executive Board of the Clean Development Mechanism to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol*, at 5, U.N. Doc. FCCC/KP/CMP/2009/16 (Nov. 4, 2009).

68. *Id.* at 1. U.N. Under-Secretary General and Executive Director of U.N.E.P., Achim Steiner, stated in October 2007 that "[a]n estimated 100 billion dollars of funds are set to flow from the North to the South as a result of the Clean Development Mechanism." Achim Steiner, *The United Nations Response to the Environmental Challenges of the 21st Century*, at 4, (Oct. 8, 2007), <http://www.unep.org/Documents/Multilingual/Default.Print.asp?Documentid=520&articleID=5608&I=en> (last visited Mar. 10, 2010).

69. Steiner, *supra* note 68, at 4.

70. U.N. Env't. Prog., *Global Trends in Sustainable Energy Investment 2008: Analysis of Trends and Issues in the Financing of Renewable Energy and Energy Efficiency*, at 3, available at [http://sefi.unep.org/fileadmin/media/sefi/docs/publications/Exec\\_summary.pdf](http://sefi.unep.org/fileadmin/media/sefi/docs/publications/Exec_summary.pdf) (last visited Mar. 10, 2010).

this investment.<sup>71</sup> However, in terms of emission credits generated, China leads with fifty-three percent, followed by India with just fifteen percent. By the end of 2007, 12.95 billion dollars had been raised by carbon funds.<sup>72</sup>

A major challenge is to ensure that countries in Africa benefit from the CDM. To meet this challenge, then-Secretary-General Kofi Annan launched what is called the Nairobi Framework in 2006. Several U.N. and affiliated organizations—UNEP, the U.N. Development Program, the World Bank, African Development Bank, and the FCCC Secretariat—came together to implement the Nairobi Framework, with the U.N. Secretariat acting as catalyst and facilitator.<sup>73</sup> Its initial focus has been to assist six sub-Saharan African countries (Ethiopia, Kenya, Mauritius, Mozambique, Tanzania, and Zambia) in building their capacity to take advantage of the CDM process, with the governments of Spain, Sweden, and Finland, contributing 1.5 million dollars to the project.<sup>74</sup>

Although it has to be a matter of considerable concern that only 27 of the 1,150 registered CDM projects were in Africa as of September 2008, cumulative CDM projects in the pipeline for African countries as of that date were seventy-one, including fifty-one for sub-Saharan Africa. Also, the FCCC Secretariat reports that “CDM is growing on the continent and is

71. *Id.*

72. *Id.*

73. See John Kilani, *The Nairobi Framework: Catalyzing the CDM in Africa*, [http://cdm.unfccc.int/Nairobi\\_Framework/index.html](http://cdm.unfccc.int/Nairobi_Framework/index.html). (last visited Mar. 12, 2010). The Framework has five objectives as key priority targets:

- a) Build and enhance capacity of [Designated National Authorities] to become fully operational;
- b) Build capacity in developing CDM project activities;
- c) Promote investment opportunities for projects;
- d) Improve information sharing/outreach/exchange of views on activities/education and training;
- e) Inter-agency coordination.

*Id.*

74. During the first year of the Framework, Konrad von Ritter, Sector Manager for Sustainable Development at the World Bank Institute, noted:

There has been notable increase in capacity-development resulting in a pipeline of 30 CDM projects. Of these, 14 have already signed emissions reduction purchasing agreements with World Bank carbon funds. While this is positive we all know that more needs to be done, and therefore the critical importance of the Nairobi Framework to scale up capacity development.

Framework Convention on Climate Change, Press Release, Secretariat, *Important Steps Taken to Expand CDM in Africa, Much Remains to be Done: Nairobi Framework Partners*, at 2, (Dec. 6, 2007), available [at http://unfccc.int/files/press/news\\_room/press\\_releases\\_and\\_advisories/application/pdf/nf\\_release\\_english.pdf](http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/nf_release_english.pdf) (last visited Mar. 10, 2010).

already estimated to be stimulating several billion dollars' worth of capital investment in the seven African countries hosting projects. Market stakeholders and policy-makers are looking for ways to multiply these benefits."<sup>75</sup> In October 2008, Yvo de Boer, Executive Secretary of the UNFCCC and the U.N.'s highest-ranking climate change official, exhorted African countries to participate in the current climate change negotiations which present them "with a golden opportunity to change things for the better and design a Copenhagen deal that works for Africa. For this to happen, it is crucial that African Countries put their concerns on the table and push for solutions that respond to their specific problems."<sup>76</sup>

### 3. Other Assistance to Developing Countries

In December 2006 UNEP and the UNDP launched a joint climate change initiative.<sup>77</sup> This partnership aims at further assisting countries to achieve sustainable development while they confront the changing climate. It extends to all least-developed countries and other developing countries, with a special emphasis on sub-Saharan Africa. Its two core objectives are: "1) Incorporate adaptation into national development plans and U.N. Cooperation Frameworks[;] and 2) Enable countries to access carbon finance and cleaner technologies to stimulate sustainable development."<sup>78</sup>

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75. Framework Convention on Climate Change, Press Release, Secretariat, *Africa Hardest Hit by Climate Change, Deserves Greater Share of Carbon Market Benefits: U.N.'s Top Climate Change Official*, at 1 (Sept. 3, 2008), available at [http://unfccc.int/files/press/news\\_room/press\\_releases\\_and\\_advisories/application/pdf/20080903/africa//carbon/forum/press/release.pdf](http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/20080903/africa//carbon/forum/press/release.pdf) (last visited Mar. 10, 2010).

76. *Id.* at 2.

77. U.N. Env't. Prog., Governing Council, Twenty-Fourth Session of the Governing Council/Global Ministerial Environment Forum, *Cooperation Between the United Nations Environment Programme and the United Nations Development Programme*, at 1, U.N. Doc. UNEP/GC/24/INF/19, (Dec. 13, 2006).

78. *Id.* at 5. See *id.*, Appendix 2: *UNDP-UNEP Partnership on Climate Change*, at 11–12. The report makes a telling point:

To date, the benefits of the Clean Development Mechanism have largely bypassed the Least Developed Countries. Only a handful of countries account for the bulk of registered CDM projects, and there are concerns that the types of CDM projects registered so far provide limited development benefits. To realize the full potential of the CDM as the financing mechanism for sustainable development, a key challenge for developing countries is to remove the institutional, legal and capacity barriers that limit their access to the flourishing and dynamic carbon finance market. To help developing countries address this challenge, UNDP and UNEP will increase their current collaboration in carbon finance, directly supporting the Nairobi Framework on Catalyzing the CDM in Africa agreed at COP12 by six agencies.

## V. CONCLUSION

Climate change poses a formidable challenge for all countries, but its major impact will be on developing countries, especially the least developed countries, as they lack the resources, capacity, logistics, and wherewithal they need to fulfill their mitigation obligations and to undertake adaptation activities. Thus, the assistance of developed countries becomes imperative. International environmental law, as well as international human rights law, can play a robust role as appropriate mechanisms are crafted to support developing countries in their response to the adverse impacts of climate change. The matter is urgent and calls for political will to make it happen. However, the initial expectations that the Climate Change Conference in December 2009 in Copenhagen might result in the adoption of a successor to the Kyoto Protocol are not likely to be met. Instead a political accord may be reached there which might ultimately lead to a comprehensive and operational agreement with specific targets and timetables.<sup>79</sup>

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79. See Press Release, White House, Office of the Press Secretary, President to Attend Copenhagen Climate Talks (Nov. 25, 2009), <http://www.whitehouse.gov/the-press-office/president-attend-copenhagen-climate-talks> (last visited Mar. 10, 2010). The White House announced that President Barack Obama will personally participate in the Climate Change Conference in Copenhagen on December 9, 2009, and that “the President is prepared to put on the table a U.S. emissions reduction target in the range of 17 percent below 2005 levels in 2020” toward his goal to reduce emissions 83 percent by 2050–30 percent reduction below 2005 levels in 2025 and a 42 percent reduction below 2005 in 2030.