Healthy Planet, Healthy People: Integrating Global Health into the International Response to Climate Change

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LINDSAY F. WILEY∗

HEALTHY PLANET, HEALTHY PEOPLE: INTEGRATING GLOBAL HEALTH INTO THE INTERNATIONAL RESPONSE TO CLIMATE CHANGE

Abstract

The potentially groundbreaking negotiations currently underway on the international response to climate change and national implementation of commitments under the United Nations Framework Convention on Climate Change (UNFCCC) include a number of hotly contested issues: (1) what degree of climate change is acceptable as a basis for emissions targets, (2) to what extent and in what ways climate change mitigation should incorporate emissions reductions or increased sinks for developing countries, (3) whether the legal regime governing mitigation can take advantage of the huge mitigation potential of changed practices in the land use and agricultural sectors, (4) how adaptation should be financed and at what level, and (5) what should be the priorities for adaptation funding. Health concerns should play a crucial role in resolving all of these questions, but it is by no means certain that they will. In addition to providing a more compelling justification for climate change mitigation and a means for evaluating what degree of climate change is acceptable, health concerns might shape the contours of an emissions trading mechanism by weighing in favor of including mitigation actions in developing countries as well as land use and agricultural sources of emissions and sinks. Such efforts represent low-cost reduction opportunities and have direct co-benefits for health. In addition to arguing for a secure financing mechanism with potential to generate massive funding for adaptation as a global health promotion priority, health policymakers should play a role in determining priorities for the use of adaptation funds. Emphasis on climate change as a fundamental transformation of our environment that will have important consequences for human health has the potential to motivate the additional political will needed to improve our global health infrastructure in ways that will better position us to provide routine services as everyday needs for those services intensify. Many potential climate change adaptation projects, such as the development of better disease surveillance and response capacity, improvements in sanitation, protection of food and water security, and the strengthening of natural disaster preparedness and

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response capabilities, look a lot like traditional international health initiatives. Because international cooperation for climate change adaptation is driven by the transboundary causes of climate change rather than the transboundary nature of the health threats at issue, the adaptation regime has the potential to prioritize some previously neglected health concerns that contribute significantly to the global burden of disease, even where those concerns do not pose a threat to the industrialized world. Given the importance of health impacts in advocating for and developing the mechanisms that will govern climate change mitigation and adaptation, as well as the risk of diversion of funds away from global health initiatives toward climate change initiatives in a time when financial resources are being stretched thin due to a global economic crisis, global health policymakers must fight for their rightful place at the table in climate change negotiations and governance at the national and international level.
I

INTRODUCTION

Climate change has been called the “defining human development challenge of the 21st century.”1 On the one hand, there is ever-increasing scientific certainty that anthropogenic emissions of greenhouse gases (GHG) and destruction of sinks has sped up, or “forced,” climate change2 at such a rate that our technology, our institutional capacity, and our political will may not be sufficient to respond to the challenges it will raise.3 On the other hand, the process will take place over the course of several decades, and there is still considerable uncertainty about what the exact impacts of climate change will be and how quickly they will occur, particularly at the local level.4 Policymakers at every level of government are currently grappling with the prospect of massive changes to our way of life that will be required both to mitigate climate change – through reduction of emissions and increase of sinks so that its potential extent will be more limited – and to adapt to climate change through changes to human systems. Such changes must ensure that we are better prepared to respond to the impacts of climate change that have, at this point, become either largely inevitable or are already being experienced.

At the annual Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC) held in Copenhagen in December 2009,5 member states took action to address the fate of two of the UNFCCC’s key projects. The first was agreement upon a successor to the largely unsuccessful and soon-to-expire Kyoto Protocol,6 which has been the basis of the primary climate change mitigation regime at the international level. The second was the negotiation of increased financing for a new monetary fund for adaptation to the impacts of climate change in the developing world, which has the potential to dramatically increase resilience to the threats posed by climate change.7 The ongoing negotiations on the implementation of a post-2012 framework at

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4 Id.
the international and national level include a number of hotly contested issues: (1) what degree of climate change is acceptable as a basis for emissions targets, (2) to what extent and in what ways the mitigation regime should incorporate mitigation approaches in developing countries, (3) whether the mitigation regime can take advantage of the huge mitigation potential of changed practices in the land use and agricultural sectors, (4) how adaptation should be financed and at what level, and (5) what should be the priorities for adaptation funding.

Health concerns should play a crucial role in the resolution of all of these issues, but it is by no means certain that they will. Current and future health impacts of climate change have garnered some attention in recent years, but global environmental governance remains grounded in a tradition of natural resources conservation that has not always been receptive to what it casts as an anthropocentric view of environmental issues. Although health impacts have played a role as an important motivation for environmental regulation,8 environmental governance structures at the national and international level have largely failed to include health advocates and policymakers in a coordinated response to environmental health threats.9 At the same time, global health governance has referred to environmental concerns mostly in passing, noting the role of climate change, for example, as one among many transboundary concerns with implications for global health,10 but rarely delving into the potential of environmental policy as a significant opportunity to better meet the basic survival needs of the world’s least healthy people.

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The effects of climate change will be experienced in every region, but will disproportionately affect the world’s poorest people. In addition to creating novel threats to health and shifting the geographic scope of existing threats, climate change will also act as an intensifier, dramatically increasing the magnitude of preexisting problems ranging from poverty, conflict, and hunger to infectious and chronic disease burdens. In poor countries and in poor communities within wealthy countries, the effects will be monumentally more devastating. The world’s poorest and least healthy people also have the least capacity to ameliorate the potentially devastating effects of climate change. Climate change, therefore, not only challenges the international community to find solutions to reduce the health effects, but also to address the inevitable questions of environmental justice.

In recent years, health advocates have begun to raise the profile of health consequences as a major impact of climate change through promotions such as World Health Organization’s (WHO) World Health Day and the American Public Health Association’s (APHA) Public Health Week, both of which focused on climate change in 2008. Climate change is expected to act primarily as an intensifier and to some extent a redistributor of existing threats to health. Direct effects include excess mortality and morbidity due to exacerbated air pollution, heat waves, hurricanes, floods, wildfires, and other natural disasters. Devastating natural disasters have indirect effects on health as well, through increased infectious disease risk and toxic exposures through contaminated floodwaters or unsanitary shelter conditions. Climate change also creates fertile conditions for, and alters the geographic range of, infectious disease vectors such as insects and rodents — for example, bringing malaria to higher altitudes and dengue fever further north. Increases in food-borne illness, which thrives in warmer conditions, are also anticipated. Worldwide, scarcity of clean, safe water for drinking and sanitation is perhaps the most concerning anticipated impact of climate change. Water scarcity can be devastating to human health, especially through its impact on diarrheal illnesses, which are among the greatest killers of children in the developing world. Ecosystem changes and

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13 Id.
16 See section II, infra, for discussion of health impacts in greater detail.
water scarcity will in turn impair crop, livestock, and fisheries’ yields, exacerbating what is already a growing food crisis. More remote, but even more devastating impacts may come in the form of economic instability, migration, and armed conflict in a time of competition for increasingly scarce resources.

Preventative health strategies focusing on the environment range from household measures such as safe water storage and food handling practices to energy, transportation, manufacturing, agriculture, land use, and urban planning policies – all areas that are relevant to the ongoing debates surrounding climate mitigation and adaptation approaches.17 A key lesson of environmental health is that environmental policy interventions can have significant co-benefits for health.18 There can also be significant gains for social and economic wellbeing, despite the fact that environmental health is often pitted against economic development considerations in policy debates.19 Climate policy adds a new layer to the complex relationships between the environment, health, and development. Thus far, however, international, national, and even local approaches to climate change have been largely driven by an environmental policy community that has its foundation in natural resources conservation. Unless health policymakers and advocates play a more integral role in the negotiation and implementation of environmental and climate policy, they may miss important opportunities to reduce the global disease burden through policy interventions that have the greatest potential for co-benefits for health. The potential for action on both mitigation and adaptation following the Copenhagen Conference of Parties in December 2009 makes this a critical time for health advocacy. As political momentum in support of strong climate change policy builds, health advocates must act to ensure that mitigation mechanisms take potential co-benefits for health fully into account, and that support for global health infrastructure will be a key part of our international adaptation response.

This paper argues that emphasis on climate change as a fundamental transformation of our environment that will have important consequences for human health has the potential to motivate and shape consensus on mitigation of climate change while also improving our global health

infrastructure as an adaptation to climate change impacts. Part II focuses on the global health burden currently attributable to environmental causes and on the anticipated health impacts of climate change. Part III provides background on international climate governance under the UNFCCC and on the current status of negotiations. Part IV sets forth an agenda for the integration of global health concerns into the negotiation of a series of key issues currently under debate in the international response to climate change and the national implementation of international obligations. Part V offers a conclusion emphasizing the importance of involving global health policymakers in the response to climate change.

II

ENVIRONMENTAL HEALTH AND THE HEALTH IMPACTS OF CLIMATE CHANGE

In many ways, environmental health has not received policymakers’ attention in proportion to its importance as a source of global disease burden. The WHO estimates that nearly one-quarter of the global disease burden, and more than one-third of the disease burden among children under age fourteen, is attributable to modifiable environmental factors such as unsafe drinking water and sanitation and air pollution (both indoor and outdoor).20 The impact of the environment is seen especially in diarrheal illness, lower respiratory infections, unintentional injuries, and malaria. Approximately 94% of diarrheal illness worldwide is attributable to modifiable environmental factors, mostly inadequate access to safe drinking water and unsafe sanitation and hygiene practices.21 Approximately 42% of malaria is attributable to modifiable environmental factors such as land use policy and practices, deforestation, water management, settlement siting, and house design.22 In turn, diarrheal illness, lower respiratory infections, and malaria are among the biggest contributors to the global burden of disease.23 The burden of unhealthy environments is shouldered disproportionately by children, particularly in the developing world. WHO estimates that more than four million child deaths each year are attributable to environmental causes, mostly in the developing world, and that the infant death rate from environmental causes is twelve times higher in developing countries than in developed countries.24 If, as Larry Gostin has suggested, one of the goals of global health law and policy should be meeting the basic survival needs of the world’s least healthy

20 See WHO, Preventing Disease, supra note X, at 9 (measuring disease burden in terms of Disability Adjusted Life-Years (DALYs)).
21 Id.
22 Id. at 10.
23 Id. at 11.
24 Id.
people,25 then environmental health is an excellent starting point. Climate change acts largely as an intensifier and to some extent a redistributor of existing threats to health, acting through the same pathways by which environmental factors are already contributing to global disease burden.26

Perhaps the most high profile health impact of climate change is an increase in the extremity and frequency – as well as a geographical shift – of extreme weather events. Heat waves are the health threat that is most intuitively connected to climate change, and discussion of the climate-health nexus often focuses on recent heat waves in Europe and North America, which have caused excess mortality measured in tens of thousands of lives.27 Sea level rise has the potential to dramatically increase storm surge,28 which in turn plays an important role in determining how destructive a particular storm will be. The geographic distribution of hurricanes and tropical storms will also change, bringing greater frequency of severe storms to some areas.29 An increase in the frequency and severity of floods, which are the most common severe weather event, is also likely as rising average temperatures intensify evaporation and precipitation in some areas.30 Out of control wildfires, which are not classified as weather events but are strongly affected by weather conditions, are also likely to become more frequent and more severe in some areas.31 In addition to causing direct injuries, extreme weather events also have less obvious effects on health. Researchers have

26 See generally Anthony Costello, et al., Managing the Health Effects of Climate Change, 373 The Lancet 1693 (2009)
pointed to the mental health effects of disasters as a hidden burden on health.\textsuperscript{32} We might also see increased exposure to infectious pathogens or toxic chemicals through contaminated floodwaters or unsanitary living conditions following an event.\textsuperscript{33} Natural disasters can also cause a dangerous disruption in health care for those suffering from chronic diseases like HIV/AIDS, diabetes, or cardiovascular disease, for which regular medication and treatment is necessary.

However, perhaps even more insidious than the more high-profile events that garnered some public awareness as being affected by climactic conditions, are the more gradually emerging, but equally concerning effects on health anticipated as an impact of climate change. For example, exacerbated air pollution will have an impact on cardiovascular and respiratory health.\textsuperscript{34} Rising temperatures result in higher levels of ground-level ozone pollution (better known as “smog”), which is formed by chemical reactions between certain air pollutants (mainly nitrogen oxides and volatile organic compounds\textsuperscript{35}) and sunlight.\textsuperscript{36} While ozone is beneficial in the upper atmosphere where it provides protection from UV rays, it becomes a harmful pollutant when it forms at ground level. Exposure to ground-level ozone pollution can cause short-term, reversible diminished lung function as well as more persistent inflammation of lung tissue.\textsuperscript{37} People who live in areas with high ozone concentrations are more likely to suffer from asthma\textsuperscript{38} and have a higher risk of premature death.


\textsuperscript{33} See, e.g., U.S. Centers for Disease Control and Prevention, Morbidity Surveillance After Hurricane Katrina – Arkansas, Louisiana, Mississippi, and Texas, \textit{55 MMWR – Morbidity & Mortality Weekly Report} 727 (September 2005).


\textsuperscript{35} Volatile organic compounds (VOC), including carbon dioxide and methane, are emitted through the burning of fossil fuels and evaporation from stored fuels, solvents, and other chemicals, as well as evaporation from vegetation. See, e.g., U.S. Geological Survey, Volatile Organic Compounds, at http://toxics.usgs.gov/definitions/vocs.html (last visited March 20, 2009).


\textsuperscript{38} See, e.g., J.J. Kim, American Academy of Pediatrics Committee on Environmental Health; Ambient Air Pollution: Health Hazards to Children, \textit{114 Pediatrics} 1699 (2004); J. Schwartz, Short Term Fluctuations in Air Pollution and

\textbf{Wiley, forthcoming} \textit{Journal of Environmental Law and Litigation}
Particulate matter (PM2.5), which includes all airborne particles that are less than 2.5 micrometers in diameter, can be either emitted directly from sources of pollution or formed through atmospheric reactions (which are influenced by rising temperatures) among various pollutant gasses. PM2.5 exposure has been associated with respiratory and cardiovascular effects, ranging from coughing and difficulty breathing, diminished lung function, and exacerbation of asthma to the development of chronic bronchitis and increased incidence of heart attack and arrhythmias.

Researchers also anticipate an increased incidence of zoonotic, vector-, food-, and waterborne diseases as changing environmental conditions affect the survival, persistence, habitat range, and transmission of a variety of pathogens. Vector-borne infectious diseases, such as malaria, dengue fever, West Nile Virus, and Lyme Disease are those that are spread by blood-feeding arthropods such as mosquitoes and ticks that carry pathogens from human to human. Zoonotic diseases, such as Hantavirus carried by rodents or H5N1 influenza carried by birds, develop in an animal population reservoir and are spread to humans that come into contact with infected animals. Both types of illness are affected by the shifting weather patterns that come with climate change as the habitats and size of animal populations shift in ways that may bring them into greater contact with humans.

The impact of climate change on malaria and dengue fever, the vector-borne illnesses with the greatest disease burden, are particularly concerning. Increased rainfall and temperatures have a significant impact on increasing the length of transmission season and altering atmospheric conditions. The development of chronic infections, such as Hantavirus carried by rodents or H5N1 influenza carried by birds, develop in an animal population reservoir and are spread to humans that come into contact with infected animals. Both types of illness are affected by the shifting weather patterns that come with climate change as the habitats and size of animal populations shift in ways that may bring them into greater contact with humans.

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the geographic distribution of vector mosquitoes, both in terms of latitudinal and altitudinal
distribution. Food-borne illness is also sensitive to climate change as higher ambient temperatures allow food-borne pathogens to thrive. Salmonellosis has been shown to be particularly sensitive to increased temperatures. Campylobacteriosis, on the other hand, is less sensitive to changes in temperatures, but is affected by climate change through its impact on water scarcity, as discussed below. Higher ocean surface water temperatures also have an impact on food poisoning through the effect of harmful algal blooms and methylation of mercury on shellfish and reef fish contamination.

Scarcity of clean, safe water for drinking and sanitation is perhaps the most concerning anticipated impact of climate change. Water scarcity can be devastating to human health, especially through its impact on diarrheal illnesses, which are among the greatest killers of children in the developing world. Incidence of water-borne diseases, such as cholera, cryptosporidiosis, and campylobacteriosis, is expected to rise as a result of climate change – as an effect of both droughts, which concentrate pathogens in pools, and floods, which increase runoff and microbial contamination of water supplies. Water-washed diseases – illnesses for which the main transmission pathway is not through contaminated water, but which are affected by hygiene practices and thus sensitive to water scarcity, such as rotavirus – are also expected to be significantly affected by climate change.

Over a longer time horizon, we may see even more serious threats to health due to major changes in human settlements and increasing armed conflict as a result of climate change and sea

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43 See ICCP, supra note X, at 407.
44 Id.
46 Id.
48 IPCC, supra note X, at 400.
49 Id.
51 See WHO, Preventing Disease, supra note X, at 9 (measuring disease burden in terms of Disability Adjusted Life-Years (DALYs)).
52 ICCP, Chapter 8: Human Health, supra note X, at 401.
53 Id.
level rise.\textsuperscript{54} We could see widespread food and water insecurity on an unprecedented scale as the
global food and water crises that are already occurring as a result of population growth,
environmental degradation, and economic factors\textsuperscript{55} are exacerbated by climate change. The
mutually reinforcing trends of climate change and environmental degradation are “likely to make
many parts of the world uninhabitable, or at least uneconomic,” potentially resulting in mass
migration both within and across national borders.\textsuperscript{56}

III

THE UNFCCC AND THE 2009 CONFERENCE OF PARTIES

A. International Cooperation for Climate Change Mitigation and Adaptation

In 1992, most nations of the world, including the United States, signed the UNFCCC, which
went into effect in 1994.\textsuperscript{57} As a framework convention, the UNFCCC did not itself create significant
legally binding obligations. Rather, it set forth the broad goal of stabilizing atmospheric greenhouse
gas concentrations at a level that would prevent dangerous anthropogenic interference with the
global climate system within a time frame that would allow for natural adaptation of ecosystems to
climate change, protection of food production, and sustainable economic development.\textsuperscript{58} The
UNFCCC’s climate change mitigation policy is directed primarily at industrialized countries, and its
original goal was to stabilize those countries’ greenhouse gas emissions at 1990 levels by the year
2000. As of 2009, 192 countries had ratified the UNFCCC.

In 1997, following particularly tense negotiations at the Kyoto Conference of Parties to the
UNFCCC, the parties adopted the Kyoto Protocol, which went into force in 2005.\textsuperscript{59} In the
agreement that was eventually hashed out despite considerable discord between the U.S. and E.U.
delations, thirty-eight developed countries, listed in Annex 1, agreed to reduce their emissions of
six key greenhouse gases to at least 5% below 1990 levels by 2012.\textsuperscript{60} Developing countries were not

\textsuperscript{54} See, e.g., Lester R. Brown, \textit{Plan B 3.0} (2007).
\textsuperscript{58} UNFCCC, art. 2.
\textsuperscript{60} Id.
committed to binding targets, though they had the option of establishing voluntary targets. In addition to emission reduction targets, the agreement established a system of emissions trading, joint implementations, and clean development mechanisms to encourage cooperation between developed and developing countries to reduce emissions. Although the United States signed the Protocol, it is the only major developed country that has not ratified it. In 1997, the U.S. Senate passed a unanimous resolution stating that the United States should not be a signatory to any protocol that did not include binding emission reduction targets for developing as well as developed countries. The Clinton administration never sent the protocol to the Senate for ratification and the Bush administration openly opposed ratification, arguing that China and India were not bound to emissions reduction targets and that participation in such a regime would unjustifiably disadvantage the U.S. economy against these emerging competitors.

B. Negotiation of a Successor to the Kyoto Protocol

Because the United States refused to ratify the Kyoto Protocol, and because those countries that did ratify have virtually all fallen far short of meeting their obligations under it, the Kyoto Protocol has been widely regarded as a failure. In any case, the commitments contained in the Kyoto Protocol expire in 2012 and, starting in 2004, the UNFCCC member states began to sketch out what a successor GHG emissions-reduction regime might look like, and to establish milestones to stay on track for negotiation of a successor protocol. At the 2007 Conference of Parties in Bali, the United States joined other nations in agreeing to negotiate a successor protocol by the end of 2009 as part of the Bali Action Plan. Although a change in the U.S. presidential administration may make U.S. participation in the Kyoto successor regime possible, any agreement would still have to be ratified by two-thirds of the U.S. Senate, and ratification by such a majority is unlikely unless emerging economies that are important economic competitors for the United States are bound to emission reduction targets. Draft agreements were presented by the chair and discussed by the

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61 Id.
parties during negotiation sessions in Bonn, Germany in June and August of 2009.\textsuperscript{66} Ultimately, however, much of the substance of the new mitigation regime was left unsettled leading up to the December 2009 Conference of Parties in Copenhagen.\textsuperscript{67} The Intergovernmental Panel on Climate Change (IPCC) had recommended that in the Copenhagen agreement, industrialized countries must commit to reducing their emissions by 25\%–40\% compared to 1990 levels by 2020 to remain close to a 2°C rise in average temperatures. Early on, it became apparent that such a commitment was unlikely. At the 2008 Conference of Parties in Poznan, the European Union, Norway, and Switzerland were among the only parties who expressed some willingness to seriously negotiate on this point.\textsuperscript{68}

\textbf{C. The Adaptation Regime}

Whereas mitigation efforts seek to avoid harmful anthropogenic climate change, or at least reduce its extent, adaptation efforts seek to reduce the vulnerability of human settlements to the impacts of climate change. Adaptation measures seek to build “ecological and social community resilience to climate change.”\textsuperscript{69} Ecological resiliency includes “protecting and preserving the natural ecosystems that help human communities survive through buffering from floods, filtering drinking water, stabilizing soil, providing sustainable forest products, and preserving a host of other ecosystem services necessary for human survival.”\textsuperscript{70} In the context of climate governance under the UNFCCC, ecological resiliency is not pursued for the purpose of “preserving functioning ecosystems and their myriad component species for their own sake,”\textsuperscript{71} though that is a purpose of other international environmental agreements such as the Convention on Biological Diversity.\textsuperscript{72} Social resiliency includes “forging the democratic capacity to help marginalized communities accrue the administrative, technical, and political power that will help them make difficult decisions and

\begin{footnotesize}\begin{enumerate}
\item \textit{Id.} at 44.
\item \textit{Id.}
\end{enumerate}\end{footnotesize}
survive the coming vicissitudes of nature and the coming economic and political upheavals . . . that are now befalling and will continue to befall them.”73 More specific to the concerns of global health law, adaptation of human systems includes the building of capacity, including through law and policy reform, to face the health impacts anticipated as a result of climate change.

Article 2 of the UNFCCC sets a goal of stabilizing atmospheric GHG emissions at such a level as would “allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.”74 As it has become increasingly clear that mitigating climate change – to the point where natural adaptation is possible – is unlikely to be achieved, attention has shifted to planned adaptation of human systems. The concept of planned adaptation of human systems to climate change has always been a part of the UNFCCC. Article 4.4 of the UNFCCC requires that developed countries “shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects.”75 Until relatively recently, however, adaptation has taken a backseat to mitigation efforts.

Focus on adaptation has been somewhat controversial within the environmental advocacy and climate science communities because some fear that it will reduce the impetus for mitigation efforts by admitting that mitigation efforts are unlikely to reduce anthropogenic climate change at a fast enough rate to prevent significant impacts, and by casting those impacts as manageable through technological and social advances.76 On the other hand, by “shift[ing] the question from whether impacts from climate change will occur in the near term, and whether some portion will be unacceptable, to the hows of achieving some control over the more dire consequences expected,”77 the adaptation question has in some ways moved the climate community forward and has created the opportunity for greater engagement of scientific, advocacy, and policy communities in other fields, including agriculture and global health. Additionally, the focus on adaptation, by making the discussion of climate change impacts more concrete, is also more amenable to the framing of climate change as an environmental justice issue. Research on projected impacts, and on the likely

73 Takacs, supra note X, at 44.
74 UNFCCC, art. 2.
75 UNFCCC, art. 4.4.
77 Kristie L. Ebi, Joel B. Smith and Ian Burton, eds. Integration of Public Health with Adaptation to Climate Change: Lessons Learned and New Directions (2005), xviii.
vulnerability and adaptation capacity of various regions, highlights the fact that climate change is largely driven by those in industrialized nations; meanwhile, its impacts will be felt first and foremost by those in developing nations who also have the least capacity to adapt to those impacts.\textsuperscript{78}

In 2006, at the Nairobi Conference of Parties, member states negotiated the establishment of the Kyoto Protocol Adaptation Fund and the Nairobi Work Program on Adaptation. The Fund is generated by a 2% tax levied on Clean Development Mechanism (CDM) projects, which are emission offset projects undertaken by industrialized countries (primarily by way of private enterprises) in the developing world.\textsuperscript{79} This innovative funding mechanism has the potential to create an adaptation budget that could be as much as five times the budgets of the two previously created climate change funds, which relied on direct funding from donor countries.\textsuperscript{80} The Adaptation Fund is expected to generate between $80 and $300 million per year between now and 2012, when the Kyoto Protocol expires.\textsuperscript{81} The Fund is dedicated to enabling concrete adaptation activities, and experts are anticipating a frenzy of proposals seeking a piece of the pie.

The Adaptation Fund Board has indicated that that it wishes “to implement adaptation activities promptly where sufficient information is available to warrant such activities, inter alia, in the areas of water resources management, land management, agriculture, health, infrastructure development, fragile ecosystems, including mountainous ecosystems, and integrated coastal zone management.”\textsuperscript{82} Because the United States has not ratified the Kyoto Protocol, it does not currently have any direct means of influencing decisions with respect to the Adaptation Fund. Instead, the European Union has taken on a leadership role. Significant progress was made in 2008 and 2009 on readying the Adaptation Fund for implementation. The basic structure of the fund was established,

\begin{footnotesize}
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\item \textsuperscript{78} See Anthony Costello, et al., Managing the Health Effects of Climate Change, 373 The Lancet 1693, 1712 (2009).
\item \textsuperscript{79} The CDM has a somewhat controversial past. It grew out of a proposal by Brazil with the support of the G-77 nations for a means for compelling Annex I countries to meet their emissions reduction targets by requiring a fine for emissions in excess of their targeted limits, funds from which would be used for mitigation and adaptation projects in developing countries. Eventually, however, the program morphed into a mechanism for allowing industrialized countries, and more specifically private actors within them, to avoid real emissions reduction while making a profit at the same time. Private enterprises can use CDM projects in developing countries (primarily China, Brazil, Mexico and India, which have the infrastructure to meet the bureaucratic and technical requirements imposed by the CDM) to offset requirements imposed on them by their national governments. They can also profit by selling or trading credits in an emissions trading regime. “Much, if not most of the U.N.-sponsored effort in the past ten years around climate change has gone into making a functional CDM, much to the benefit of business interests around the world. Private actors generated $US30 billion per year worth of CDM projects in 2006, the first year after the Kyoto Protocol went into effect.” Takacs, supra note X, at 53-54.
\item \textsuperscript{81} Id.
\end{itemize}
\end{footnotesize}
and the groundwork was laid for a large-scale finance architecture to be negotiated in Copenhagen. Much to the chagrin of developing countries, however, industrialized countries expressed considerable reluctance toward increasing the funding through a variety of mechanisms that have been proposed. Furthermore, the financing of the Adaptation Fund is linked to the potential success of a post-2012 mitigation regime. Developing countries expressed at the Bali COP in 2007 that their willingness to participate in the mitigation regime hinged on the scaling up of funding for adaptation.

Although recent developments indicate significant progress on the development of an adaptation regime under the UNFCCC, adaptation in the developing countries that are at greatest risk of catastrophic climate impacts suffers from an implementation gap, as funds have not been provided and the infrastructure required to make use of adaptation funding is not in place in the poorest countries. One of the great ironies of climate change adaptation is that countries that are likely to see the least severe impacts from climate change have spent monumentally more on adaptation within their borders than they have donated to adaptation in the poorest countries, where far more significant impacts will be felt. While developed nations are currently spending about $40 million per year to fund adaptation in developing countries, they are spending about $40 billion per year on their own adaptation projects.

86 Bals, supra note X, at 4.
87 Id.
88 80% of CDM projects, which develop mitigation and adaptation capacity in the developing world, are in Brazil, China, Mexico, and India, where infrastructure is advanced enough to meet the bureaucratic and technical requirements imposed by the CDM. Takaes, supra note X, a Y.
IV

THE ROLE OF HEALTH ADVOCACY IN THE NEGOTIATION AND IMPLEMENTATION OF A POST-2012 FRAMEWORK

A. Putting a Human Face on Climate Change

Policymakers, advocates, and scholars alike have noted that putting a human face on climate change could be the key to motivating the massive political will that will be required to effectively respond to climate change. Roberto Bertolini of the World Health Organization says that he hopes that climate change will bring to mind the image of a malnourished child in Africa dying of diarrheal illness rather than the image of a drowning polar bear.90 Lisa Heinzerling, a legal scholar who was recently named Senior Climate Counselor to the Administrator of Environmental Protection Agency, has argued that the characterization of climate change as “knowing killing” of people in the developing world creates a moral obligation on the part of industrialized countries to respond.91 But beyond these broad strokes and general references to the connection between climate change and global health, what are the concrete opportunities for health advocates to influence the international response to this emerging threat? As a good starting point, putting a human face on climate change has an important role to play in reaching an agreement on the limit beyond which the extent of climate change becomes unacceptable.

As discussed above, the objective of the UNFCCC is the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”92 What that level is and what the timeframe should be is still a matter of debate. The goal that has gained consensus in negotiations leading up to Copenhagen (but agreement upon which was still far from certain) is a limit to global warming of 2°C. In the months leading up to Copenhagen, a growing number of parties began calling for an even stricter limit of 1.5°C, based on concerns that the impacts even at a 2°C increase are unacceptable.93 The European Union, Norway, Iceland, African Nations, and Chile joined the Alliance of Small Island States (AOSIS) in campaigning for this stricter limit, and other developing countries indicated that they

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90 Conversation with the author, January 21, 2009.
92 UNFCCC, art. 2.
93 See Bals, supra note X, at Y.
may join the effort as well.94 IPCC Chairman Rajendra Pachauri stated that the two-degree limit may not be ambitious enough, and activist Al Gore publically called for a 1.5°C limit.95

Even to limit global warming to an increase of 2°C, the IPCC has recommended that GHG emissions must be reduced by 25%-40% of 1990 levels by 2020.96 By way of comparison, the Obama administration has recently indicated a willingness to cut emissions to 1990 levels (the so called “zero percent target”) by 2020.97 The Kyoto Protocol commits 37 industrialized countries and the European Union to reducing emissions to 5% below 1990 levels by 2012, and parties have failed to meet even those modest targets.98 The European Union recently indicated willingness to commit to a 30% reduction below 1990 levels by 2020, contingent upon an agreement by other nations to do the same.99 Although this was the most ambitious target announced by any industrialized country, experts believe that even a reduction of this scale may not be sufficient to limit global warming to under 2°C.100

The campaign for consideration of a 1.5°C pathway has been driven in large part by arguments regarding sovereignty and the claim that no nation’s survival is negotiable.101 In addition to considering whether some small island states would cease to exist altogether under the 2°C scenario, however, policymakers should highlight the considerable difference in impacts, particularly health impacts, that might be seen between the two paths, and between the 2°C pathway and an even higher degree of change. The 2°C limit appears to be the point at which sea level rise would be severe enough that millions more people experience coastal flooding,102 though, increasingly, scientists believe that point may be reached at the 1.5°C point. Most of the health impacts described above begin at the 0.5°C point, however, and some of them are already in evidence today. Localized impacts on food security are currently in evidence, but experts believe that decreases in crop yields will become widespread by the 1°C point, and will reach critical levels by 3.5°C.103 Water stress is
increased at an extremely low threshold and worsens rapidly with increasing average temperatures. More research is needed to assess the relationship between the severity of health impacts and increasing average temperatures, but the argument here is that emphasis on health impacts likely to be felt by a large portion of the world’s population may be more persuasive than primarily pointing toward individual nations with relatively small populations that will be utterly devastated.

B. Sectoral Approaches to Mitigation with Co-Benefits for Health

In addition to providing a more compelling justification for climate change mitigation, health concerns might shape the contours of the mitigation regime at the international level as well as national-level implementation of international obligations. Health advocates should pay particular attention to the incorporation of land use regulation into climate change mitigation strategies. Worldwide, poor land use management, particularly deforestation, accounts for a greater share of GHG emissions than either the transportation or industrial sectors – more than 20% of total emissions. Creation and maintenance of biological sinks for carbon is a difficult area to regulate due to monitoring and measurement challenges, but it has important co-benefits for health, as well as for biodiversity and support of sustainable livelihoods. Reforestation and avoided deforestation have gained ground in UNFCCC negotiations and may play a significant role in the post-2012 mitigation regime, primarily through the Clean Development Mechanism. Promotion of sustainable agricultural practices to reduce emissions and increase sinks has not played a major role in international climate governance, but could still be an important part of national-level strategies to meet targets imposed by Kyoto and its successor. Of course, the incorporation of land use, forest-based, and agricultural mitigation approaches into the post-Kyoto regime should be undertaken in such a way that it will supplement, rather than supplant, emissions reductions from more traditional sources in the industrialized world. Transport, industrial, and energy sector emissions also

104 Id.
106 Mohammed T. El-Ashry, An Overview of this Issue: Framework for a Post-Kyoto Climate Agreement, 8 Sustainable Dev. L. & Pol'y 2, 3 (2008).
107 Takacs, supra note X at 57-58 (noting that current Kyoto Protocol rules allow only one percent of carbon credits under the CDM to be allotted for projects in Land Use, Land-Use Change and Forestry (LULUCF) and that avoided deforestation projects are currently excluded from CDM eligibility, but it is expected they will be a part of the successor to the Kyoto Protocol).
108 The transportation sector’s current reliance on fossil fuels plays a major role in ground-level ozone and particulate matter air pollution with its resulting impacts on cardiovascular and respiratory health. A shift to greater use of public transportation and non-motorized transport (cycling, walking) has significant co-benefits for health in terms of reduction in obesity and cardiovascular disease and improved mental health. See, e.g., American Public Health Association,
have more direct, local impacts on health in addition to their impact through climate change. Most experts agree, moreover, that mitigation from all sectors and in both industrialized and developing nations will be necessary to hold the extent and rate of climate change within boundaries that allow for successful adaptation.111

Proponents of forest-based mitigation approaches see reforestation (whereby “a project developer plants trees to reforest a degraded ecosystem”112) and avoided deforestation (whereby a project developer “ensures that a forest that would have otherwise been degraded or felled is, instead, preserved”113) as opportunities to mitigate climate change by reducing emissions and increasing sinks, while at the same time building ecological and social resilience to face the impacts of climate change. Forests perform a wide range of ecological services that will be in ever greater demand in the face of global climate change: stabilization of local climate fluctuations, drought prevention, aquifer protection, preservation of pollinator populations, soil stabilization, and buffering from storms and floods.114 Deforestation has a major impact on the health of local populations in addition to its indirect impact on global health through climate change.115

Some have expressed concerns, however, that Forest Carbon Offset (FCO) projects, if not carefully governed, could be manipulated to allow private industry to profit from projects that it would have undertaken anyway, even in the absence of a carbon trading mechanism that takes them into account, by using the extra carbon credits generated to allow emissions from industrialized nations to continue unabated.116 Incorporation of FCO projects into the Kyoto Protocol was intentionally circumscribed based on concerns that experts have classified into four main categories:


109 Industrial emissions of carbon dioxide as well as other GHGs has impacts on air, soil and water pollution with resulting impacts on health. See section X, infra.

110 The energy sector’s current reliance on coal-fired plants has significant impacts on air pollution, as well as soil and water pollution, with resulting health impacts. See, e.g., Federica Perera, et al., Benefits of Reducing Exposure to Coal-Burning Pollutants to Children’s Neurodevelopment in China, 116 Envt’l Health Perspectives 1396 (2008).


112 Takacs, supra note X, at 56.

113 Id.


116 See Takacs, supra note x, at 58-59.
leakage, permanence, additionality, and quantifiability.117 “Leakage” refers to the concern that stakeholders who formerly relied on felling trees in a forest that becomes protected will simply move their operations elsewhere. “[A] government may preserve one forest from planned logging and instead offer timber concessions elsewhere; logging companies denied concession rights in one country may instead cut timber in a neighboring country.”118 “Permanence” refers to the concern that carbon sinks may be destroyed in the future as forests burn or are eventually encroached upon by other land uses, resulting in an eventual increase in emissions that offsets the temporary sink.119 “Additionality” refers to the concern that some FCO projects would have been undertaken even in the absence of a carbon credit, based purely on profit motive. The result is a net increase in emissions as carbon credits awarded to projects that would have been undertaken anyway are used to avoid emission reductions in other sectors.120 Finally, “quantifiability” refers to problems of measurement, monitoring, reporting, and verification associated with “calculating present and future carbon stored in forests, particularly under different climate change scenarios,”121 as well as the difficulties of regulating a system that is more irregular in terms of its inputs and outputs than the transportation, energy, and industry sectors. This is obviously an area where there is a significant threat that potential benefits may not be realized if the regulatory mechanism does not adequately take these special considerations into account. Given that this is a hotly contested issue among the environmental policy community, health policymakers have an opportunity to highlight the co-benefits for health of reforestation, and especially avoided deforestation, as a consideration that

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119 See id., citing Philippe Cullet, Differential Treatment in International Environmental Law 124 (2007); Sagemüller, supra note X, at 195; UNEP World Conservation Monitoring Centre, supra note X, at 4-5; Ebeling, supra note X, at 47.
121 Id., citing Walsh, supra note X; Baumert, supra note X, at 396; Cullet & Kameri-Mbote, supra note X, at 99.
might tip the scale in favor of investing the considerable resources that will be required to regulate this area adequately if it is to be included in the mitigation regime.

Agricultural practices also play an important role in determining GHG emissions and carbon sinks. Agriculture accounts for roughly 14% of global GHG emissions. The link to deforestation, much of which is prompted by agricultural expansion, is also important for global emissions. Production and use of nitrogen-based fertilizers, use of fossil fuels for agricultural production, animal waste management, and livestock enteric fermentation are all important sources of GHG emissions, which can be reduced by improvements in management practices. At the same time, sustainable agricultural practices such as conservation tillage, cover cropping, and crop rotation practices can increase carbon sinks. The IPCC has estimated that there is potential for mitigation in the agricultural sector of the equivalent of 5.0-5.6 gigatons of carbon dioxide per year by 2030. For reference, total global emissions in 2000 were equivalent to 43 gigatons of carbon dioxide. The vast majority of this potential is in soil carbon sequestration – the use of sustainable agricultural practices such as conservation tillage, cover cropping, and crop rotation to increase carbon sinks by increasing the amount of carbon sequestered in soil. Reduction in methane emissions through improved management of livestock and rice farming practices, as well as reduction in nitrogen emissions through cropland management practices, round out the remaining potential for mitigation.

The huge potential for agricultural mitigation is made even more attractive by the fact that it is a relatively low-cost approach. Many abatement options are cost-neutral or even net-profit-positive and require relatively low capital investment, in part because the required technology is already well-developed. If agriculture industry players are allowed to trade the carbon credits they generate through low-cost interventions with players in other industries where mitigation is more

122 IPCC, supra note X, at Y.
124 See id. at 3; see also Gowri Koneswaran and Danielle Nierenberg, Global Farm Animal Production and Global Warming: Impacting and Mitigating Climate Change, 116 Env’tl Health Perspectives 578 (2008).
125 Id.
126 IPCC, supra note X, at Y.
129 FAO, supra note X, at 1.
130 Id. at 2, citing IPCC (2007) and McKinsey (2009).
costly, then the result will actually be profit for the agriculture industry. Thus, the incorporation of the agricultural sector into a GHG trading mechanism has the potential to *subsidize*, rather than impede, sustainable agricultural development, which in turn has significant benefits not only for climate change adaptation, but for meeting routine needs in the short-term as well. Seventy-five percent of the world’s poor live in rural areas in developing countries, and agriculture is the primary sector of the economy in most developing countries. In addition to contributing to food security, sustainable agricultural development can promote poverty reduction in surrounding communities while preserving the resilience of agro-ecosystems.

Despite these potential benefits, however, agricultural mitigation is even less far along in its incorporation into international climate governance than forest-based mitigation. Agriculture-based carbon sinks through soil carbon sequestration are not currently eligible for CDM project status, with a very narrow research-based exception, and the CDM itself makes up a relatively small part of the mitigation regime. Agricultural sequestration poses the same difficulties of permanence, leakage, additionality, and quantifiability that the forestry/land use sector presents. The technology for measuring soil carbon sequestration is perhaps farther along than policymakers realize, however, according to the U.N. Food and Agriculture Organization (FAO). Furthermore, FAO notes that leakage is less likely to be a concern in the agricultural sector than in the forestry sector in light of the likelihood that incorporation of agricultural mitigation operations is likely to be maintained and even expand, rather than decrease, agricultural production. Permanence, on the other hand, may be a greater concern in the agricultural sector than in forestry given that sustainable agricultural practices would need to be continued year after year to preserve the sequestration of carbon in soil and biomass.

The greatest barrier to enabling agricultural mitigation approaches is not technology or cost to the agricultural sector, but rather the lack of financial and regulatory mechanisms that can accommodate the attributes that set the agricultural sector apart from other regulated sectors like transportation, energy, and industry. In addition to the concerns discussed above, the agricultural sector is also a difficult area for climate change mitigation “due to the sheer size of land areas under

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131 Id.
132 Id.
133 Id.
134 See pp x-x, infra.
135 FAO, supra note X, at 3.
136 Id.
137 Id.
agriculture around the world (but at the same time this breadth of opportunity, which exceeds that of forestry, is part of its potential), the variation in agroecosystems and farming systems, as well as the large numbers of farmers that would need to be involved.”

Unlike the forestry/land use sector, incorporating agricultural sector mitigation opportunities into the international framework is far more complicated than simply scaling up the CDM. “Not only are many sources of agricultural mitigation not allowed under CDM, but its project-based and offsets approach does not generate the breadth and scale of incentives that are needed.” Whereas mitigation in the forestry sector requires only that investors preserve forests or reforest degraded land, “[c]apturing the full potential of agricultural mitigation and its co-benefits requires widespread changes in agricultural production systems, which in turn requires changes in policy, institutions, and technologies and a much broader approach by mitigation financing mechanisms.” In particular, innovative policy and financing solutions must provide equal opportunities for both small-scale land holders as well as large-scale land owners; provide equal opportunities for rights to emissions; allow for effective incentivizing and enjoyment of co-benefits; allow tradable rights to emissions reductions to be held by land users, based on traditional as well as formal systems of property rights; make options for emissions crediting and trading flexible enough to allow for the diversity of mitigation approaches that might be appropriate in a particular local context; and ensure that expanded agricultural development that takes advantage of emissions trading opportunities is in conformance with international law for the protection of biodiversity.

Perhaps the most important policy decision that would allow land use management and agricultural practices to play a major role in climate change mitigation with co-benefits for health is to what extent and in what ways developing countries are included in the post-Kyoto mitigation regime. This is indeed a key debate for determining the future of the successor mitigation regime, and was in many ways crucial to the downfall of the Kyoto Protocol. Much of the debate has focused on the reluctance of fully industrialized countries like the United States and those in the European Union to commit to binding targets unless the rapidly industrializing nations like China and India that are emerging as important competitors are also bound. But there is another

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138 Id. at 2.
139 Id. at 5.
140 Id.
141 Id. at 6.
142 See Byrd-Hagel Resolution, supra note X.
143 Although the E.U. did in fact ratify the Kyoto Protocol, it has not met its targets under that agreement. More recently, the E.U. has indicated a willingness to commit to a X reduction by Y, but only if other major competitors do the same. See Bals, supra note X.
consideration in favor of incorporating developing countries, especially those that are rapidly industrializing, into the successor mitigation regime. The great majority of land use emissions are in the developing world, and 70% of the huge potential for mitigation in the agricultural sector (most of which is based on increasing sinks) is in the developing world.\textsuperscript{144} While forest and agricultural emissions and sink reductions account for a larger share of GHG concentrations than transportation and industrial sectors when considered globally, in industrialized countries they are far less significant. Although some global health advocates, based on the premise that economic development is a critical determinant of health,\textsuperscript{145} may fear that emissions limits will hinder development in the poorer countries of the world, and thus be harmful to global health,\textsuperscript{146} it is important to understand that the mitigation strategies that will be particularly crucial at the national level if developing counties are included will have significant co-benefits for the health of local populations. A massive expansion of the CDM might allow for better exploitation of mitigation opportunities in the developing world without binding developing countries to their own emissions reduction targets, though it would not necessarily be enough to induce industrialized countries to participate in a protocol that does not bind their rapidly industrializing competitors.

C. The Importance of Public Health Infrastructure to Adaptation

Human civilization has always adapted to gradual climate change via accommodation or migration, but what is unprecedented is the rapidity with which we must now adapt to climate change that is greatly accelerated by anthropogenic forcing.\textsuperscript{147} What is new is “the conscious, planned, anticipatory approach” that has been proposed by the climate science and advocacy community.\textsuperscript{148} One of the greatest challenges to adaptation planning is that while there is nearly universal scientific consensus about the fact that anthropogenically forced climate change is occurring, and that it will have significant impacts, the rate and degree of change and the severity of impacts is still subject to a great deal of uncertainty, particularly at the local level. The attempt to premeditate adaptation strategies, and thus enhance our preparedness for the impacts of climate change, touches on technological and policy advances addressing everything from retreat of physical

\begin{footnotesize}
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\item FAO, supra note X, at 1.
\item See, e.g., Lant Pritchett and Lawrence H. Summers, Wealthier is Healthier, 31 Journal of Human Resources 841-868 (1996).
\item Kristie L. Ebi, Joel B. Smith and Ian Burton, eds. Integration of Public Health with Adaptation to Climate Change: Lessons Learned and New Directions (2005), xvii.
\item Id.
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infrastructure projects away from coastlines and building of structures to withstand more extreme weather events to developing agricultural technologies that can sustain food production in the face of harsher environmental conditions. In the health sector, adaptation to climate change is expected to require a variety of changes to health systems. Both health-care delivery systems and public health infrastructure will come into play. Adaptation to climate change is anticipated to require increased capacity to provide access to adequate and affordable health care as well as capacity for early warning systems, disease monitoring and surveillance, natural disaster and public health emergency preparedness and response, and public education interventions. Additionally, provision for basic survival needs – especially water and food systems management – will be crucial to our capacity to respond to the impacts of climate change. Particularly in the developing world, public health infrastructure and national health law have a long way to go to rise to the challenges that climate change is likely to pose.

In addition to creating novel threats to health and shifting the geographic scope of existing threats, climate change will also act as an intensifier, dramatically increasing the magnitude of preexisting problems ranging from poverty, conflict, and hunger to infectious and chronic disease burdens. Some health adaptation measures will be aimed at confronting new risks posed by climate change, at least at the local level, such as preparation for monitoring and control of malaria-carrying mosquitoes at higher altitudes where populations have not previously been exposed, or response to new diseases that might emerge in the context of changed environmental conditions. Most adaptations in the context of global health, however, are likely to be “no-regrets strategies.” Improvements of public health systems focusing on accessible basic health care facilities, clean water and sanitation, and disease control programs may be motivated in part by climate change concerns, but are likely to have significant benefits regardless of whether climate in fact has the impact that scientists anticipate. These strategies have the potential to enhance the ability of public health systems to respond to the routine threats they already face, even as those threats intensify.

The public health and global health communities have a long history of managing new threats to population well-being. In many ways, the health advocacy community is more experienced with the type of questions presented by climate change adaptation than is the environmental advocacy community. Whereas international environmental governance has typically been concerned with regimes that limit the actions of state (and consequently industrial) players,

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149 See generally id.
150 Id. at xviii.
global health governance has been more focused on promotion of health and well-being through affirmative duties. Adaptation necessarily builds more on the latter sort of inquiry and thus is in some ways far afield of the typical focus on environmental regulatory bodies. Health advocates bring their experience in evaluating the success and investigating the failure of various types of intervention as well as what they have learned through their experiments with a variety of positive law and policy tools.

Although health advocates have been regrettably late to the climate governance table, global health voices are increasingly speaking to climate change as among the most important threats to worldwide human well-being. In a recent resolution, the World Health Assembly committed to providing member states with support and advice regarding health impacts of climate change and adaptation approaches independently of the UNFCCC, and also to seeking a greater role within the UNFCCC. 151 The UNFCCC Secretariat has been criticized for not adequately “supporting processes outside the Convention which have particular expertise in areas that are key to adaptation.”152 One issue among many under consideration by the UNFCCC Ad-hoc Working Group on Long-term Cooperative Action (AWG-LCA) and the Nairobi Work Programme (NWP) is whether a permanent adaptation body or expert group should be established under the UNFCCC. 153 An adaptation body or panel would create a procedural opportunity for health experts, among others, to play a more active role in climate adaptation governance.

Another issue under debate in the UNFCCC AWG-LCA that has implications for global health policy is whether adaptation assistance from wealthy to developing countries should be “mainstreamed” with Official Development Assistance (ODA). Developed nations have increasingly called for the integration of adaptation into general development policy and planning as a precondition for funding.154 Integration of policy is not particularly controversial and most agree that it is in fact crucial to the development of coherent adaptation strategies at the national level. “Adaptation is not simply a matter of designing projects or putting together lists of measures to reduce the impacts of climate change. A national policy response would increase resilience to

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151 WHA 61.19 (May 24, 2008).
152 Harmeling, supra note X, at 42.
153 Id. at 42-44. Developing countries largely support the establishment of an adaptation body, urging that it would allow for better integration of expertise specific to the varied areas touched on by adaptation policy. Several industrialized countries have expressed opposition to the idea, noting that there are ways to make use of existing bodies outside of the UNFCCC rather than taking on the expense of creating a new adaptation body.
154 Id. at 21-22.
climate vulnerability and change and should be anchored in a country’s framework for economic growth and sustainable development and integrated in its poverty reduction strategies.”

The controversy arises because developing nations have perceived this call for mainstreaming as an indication that developed countries will shirk their responsibility for compensating developing countries for the impacts of anthropogenically forced climate change. The majority of developed countries have indeed argued that “[b]ecause the costs of adaptation . . . provide largely local benefits, were difficult to distinguish from ‘regular’ development, were suspected to be large, and smacked of compensation awarded for damages,” substantial funding should not be allocated for adaptation, and have instead suggested that Official Development Assistance will play an important role in financing adaptation measures. Given that most countries already fall far short of meeting their ODA commitments, developing countries insist that “adaptation is not funded as general Official Development Assistance (ODA), but as a kind of compensation for extra costs that are imposed on them by those who [ ] contribute the most to greenhouse gas emissions.”

The debate highlights that what may seem on the surface to be a win-win or “no regrets” situation, where funds invested for climate change adaptation also have multiple co-benefits and are thus more cost-effective, may belie an attempt to shift funds from ODA to climate change adaptation without actually increasing assistance overall. Fundamental principles of international environmental law support adaptation-only funding as opposed to ODA mainstreaming. Both the “polluter pays” principle established in the Rio Declaration and the “common but differentiated responsibility” principle, which forms the legal foundation of the UNFCCC, support exactly the compensatory character of adaptation funding to which developed countries have objected.

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155 El-Ashry, supra note X, at 5.
156 Id. at 6.
158 Harmeling, supra note X, at 22.
160 UNFCCC, art. 3 (“The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.”).
Furthermore, given that ODA already falls far short of what is needed in the developing world, the innovative financing structure of the Adaptation Fund is a promising development.\textsuperscript{161} Global health advocates should promote the integration of climate adaptation considerations into development plans, but should also advocate strongly for building upon the Adaptation Fund’s financing mechanism to allow for significantly higher funding, rather than mainstreaming of adaptation funding into ODA.

“Public health prevention and climate change adaptation share the goal of increasing the ability of nations, communities, and individuals to effectively and efficiently cope with challenges and changes. Indeed, that is what is meant by adaptation to an external stress.”\textsuperscript{162} Emphasis on climate change as a fundamental transformation of our environment that will have important consequences for human health has the potential to motivate the additional political will needed to improve our global health infrastructure in ways that will better position us to handle routine needs as those everyday needs intensify. Many potential climate change adaptation projects – such as the development of better disease surveillance and response capacity, improvements in sanitation and protection of food and water security, and the strengthening of natural disaster preparedness and response capabilities, look a lot like traditional international health initiatives.

Rights and responsibilities with respect to adaptation currently being negotiated under the auspices of the UNFCCC have the potential to create new opportunities to focus on the basic survival needs of the world’s least healthy people\textsuperscript{163} in ways that previous efforts at international cooperation with respect to health have not. This is due to a basic difference between the motivation for traditional means of international cooperation with respect to health and the motivation driving cooperation on adaptation. The recently revised International Health Regulations, for example, establish obligations for international cooperation that are largely driven by the threat of transboundary spread of disease,\textsuperscript{164} and some critics have suggested that the history of these regulations indicates that they are ultimately motivated by the threat of spread from the

\textsuperscript{161} Cf. Clunies-Ross, supra note X (financing approaches that go beyond official development assistance, including internationally coordinated levies, are necessary to provide sufficient funding for development).

\textsuperscript{162} Gary Yohe and Kristie L. Ebi, Approaching Adaptation: Parallels and Contrasts Between the Climate and Health Communities, in Integration of Public Health with Adaptation to Climate Change: Lessons Learned and New Directions (2005), Kristie L. Ebi, Joel B. Smith and Ian Burton, eds., at 18.


developing world to the industrialized world. The health impacts of climate change are, for the most part, not the sort of threats that are likely to move rapidly from the developing world to the industrialized world. It is certainly possible that changed climate conditions could foster the emergence of new viruses with the potential for global spread. It is more likely, however, that most threats – the intensification of diarrheal illness, the gradual latitudinal and altitudinal spread of vector-borne illness, greater intensity of natural disasters, and the effects of insecurity and water stress more generally – will not be of the sort that prompt self-interested action by wealthy countries to build improved health infrastructure in the developing world. The adaptation regime currently under negotiation, however, is not prompted by the transboundary nature of the impacts of climate change as much as it is by the transboundary nature of the causes. This might mean that adaptation cooperation faces an uphill battle, but if it is successful – and the tie between adaptation cooperation for the benefit of developing countries and the willingness of developing countries to participate in a mitigation regime might be the crucial key to that success – then it will allow for international cooperation on health threats that have previously been neglected.

IV

CONCLUSION

As the focus of the UNFCCC has broadened to include greater consideration of adaptation to the impacts of climate change, communities beyond the traditional boundaries of environmental regulatory policymaking have begun to realize the extent to which their interests are implicated by the international response to climate change. Indeed, adaptation requires a very different set of law, policy, and governance tools than environmental policymakers have traditionally employed in their

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165 See id.; see also Oyewale Tomori, IHR and Movement of Pathogens in a Globalized World, presentation prepared for the Forum on Microbial Threats Public Workshop (addressing perception of the motivation behind the IHR as an obstacle to implementation in developing countries).
166 See, e.g., Peter J. Hotez, et al, Control of Neglected Tropical Diseases, 357 New Engl. J. Med. 118 (2007) (comparing the impacts of neglected tropical diseases, most of which are preventable through environmental health interventions such as clean water and sanitation, with those of emerging acute infections such as Ebola virus and avian influenza).
mitigation efforts,\textsuperscript{167} and it may be that policymakers from other sectors, including global health, are better suited to the effort. In recent years, the UNFCCC has shown a greater willingness to reach out to these communities – including the health, agricultural, and land use sectors – for expertise and policymaking guidance on mitigation policy as well as adaptation. The challenges posed by such an all-encompassing scope for international cooperation are indeed considerable, but so are the opportunities. Consideration of the co-benefits of particular mitigation opportunities, for health as well as for sustainable development more generally, should play a crucial role in weighing the various policy options currently under consideration. By prompting a recalculation of the costs and benefits, bringing these broader considerations into account may serve to move the debate forward in a way that increases the likelihood that the international community will take meaningful action on climate change as the 2009 agreement is implemented and in coming decades.

\textsuperscript{167} Cf Benjamin J. Richardson & Stepan Wood, Environmental Law for Sustainability, in Environmental Law for Sustainability 1, 2 (Benjamin J. Richardson & Stepan Wood eds., Hart Publishing 2006) (discussing the “command and control” approach traditionally applied to environmental problems).