

## The Security Dimensions of Climate Change

Jennifer Wallace

Given its potential to cause a serious decline in the livability of different regions around the world, policymakers and others are beginning to identify climate change as a security threat. Although there is no consensus that this drives violent conflict, security concerns arise from its indirect impacts on local institutions in areas challenged by environmental degradation. Particularly in Europe, climate change is increasingly prominent in national security strategies and military policies, a reflection of the global reach of socioeconomic and political consequences. The fact that traditional security actors are involved in discussions on this issue confirms that state stability and security are no longer confined to the realms of territoriality and weapons-based threats. A broader understanding is needed of the threats to security posed by the direct and indirect impacts of climate change.

The direct impacts of climate change on human welfare are multiple and interlinked. The likely increase in the volatility of the water supply will threaten health and sanitation for the most vulnerable societies, for example. According to the Intergovernmental Panel on Climate Change (IPCC), 1.3 billion people today do not have adequate access to drinking water and 2 billion people lack access to sanitation. In Africa, anywhere

from 75 million to 250 million people are projected to be exposed to increased water stress due to climate change by 2020. Yields from rainfed agriculture could be cut in half, adversely affecting the food supply and exacerbating malnutrition. Increased temperatures also have a direct effect on the spread of disease, adding to the potential for the disruption of social stability. The IPCC predicts more frequent temperature extremes, heat waves, and heavy precipitation events as well as more intense tropical cyclones, threatening the physical safety of people living in areas with limited capacity to adapt to these changes.<sup>1</sup>

The indirect impacts on states and communities are equally important. Migration, the collective impacts on human welfare, and the threat to livelihoods undermine political institutions in vulnerable states. They challenge the maintenance or establishment of political and socioeconomic stability—a worrying consequence since cooperative and legitimate governance is considered the key determinant in the peaceful management of scarce resources. The negative effect on governance structures is particularly relevant when an economy depends heavily on its resource base, which is the case in most developing countries.<sup>2</sup>

As centers of production shift to areas that remain viable during climate change, state and local institutions may be incapacitated. Loss of revenue, combined with the direct threats of climate change, bode ill for

---

*Jennifer Wallace is a doctoral candidate in the Department of Government and Politics at the University of Maryland.*

institutions struggling to ease conflict, regardless of whether the tensions emerge over the division of scarce goods or other social, political, or economic divisions. The direct impacts and indirect institutional challenges linked to climate change can reinforce each other as security effects emerge at the state and transnational levels.

Recognizing these complex linkages, the U.S. Senate Committee on Foreign Relations held a hearing on the National Security Implications of Climate Change. In his opening statement Senator Richard Lugar acknowledged that “the problem is real and is exacerbated by man-made emissions of greenhouse gases. In the long run this could bring drought, famine, disease, and mass migration, all of which could lead to conflict.”<sup>3</sup>

The military board of the CNA Corporation, a nonprofit research organization for public policy decisionmakers, notes that the National Security Strategy and National Defense Strategy of the United States should directly address the threat of climate change and prepare the military to respond to the consequences. So far this advice has not been implemented in security policy planning at the national level: the most recent National Security Policy of the United States did not mention anthropogenic climate change as an issue area of concern. In contrast, climate change is mentioned specifically as a security interest within the first few pages of the European Security Strategy.<sup>4</sup>

Researchers remain divided on the direct links between climate change and violent conflict. The models have been based on one of two scenarios: conflict over increasingly scarce resources such as water or arable land or migration as a trigger of conflict. Research in the early 1990s by Thomas Homer-Dixon on the resource scarcity–conflict relationship found limited evidence supporting a connection, but it did identify a causal link when

resource competition was combined with other socioeconomic factors such as poor institutional capacity to govern the resource.<sup>5</sup>

One challenge in examining the relationship across a large number of cases was that both degradation and conflict data were only available at the national level, producing mixed results and masking the incidences of conflict within and between communities. A recent study by Clionadh Raleigh and Henrik Urdal used georeferenced data to look at the relationship of conflict occurrence to geographical boundaries rather than political ones. Although their analysis provided only moderate support for the effect of demographic and environmental variables on conflict, the authors called for further investigation into the links between physical processes and the political processes of rebellion.<sup>6</sup>

Migration is identified as the second primary climate-induced driver of conflict. In 2007 the *Stern Review* warned that “by the middle of the century, 200 million more people may become permanently displaced due to rising sea levels, heavier floods, and more intense droughts.” Weak states are particularly vulnerable to climate-induced migration, since environmental impacts can be addressed by adaptation and mitigation or by leaving an affected area, but weak institutions are less capable of successfully implementing the former strategies.<sup>7</sup>

Resource competition can emerge when local and resettled populations are forced to share subsistence resources, which can serve to worsen preexisting ethnic or social tensions. Adrian Martin notes that in communities with resettled populations, “there is a growing concern that scarcity-induced insecurities can contribute to an amplification of the perceived significance of ethnic differences and inequalities, creating the conditions for unproductive conflict....In such cases, perceptions of resource use con-

flict and perceptions of inequity are mutually reinforcing.” Nonetheless, some scholars emphasize that conflict in these cases is better explained by the migration of feuding parties or the weak institutional capacity of the receiving community.<sup>8</sup>

What the academic debate is unable to account for, based on historical incidences of conflict, is the threat to security and state stability posed by unprecedented levels of climate change due to human activities. The evidence from several areas indicates that climate change can act as a “risk multiplier,” revealing a potential for unprecedented violent outcomes as climate conditions worsen.

In Sudan, for example, climate change is an additional stress in an area already unable to meet its resource demands. The U.N. Environment Programme (UNEP) reports that “desertification is clearly linked to conflict, as there are strong indications that the hardship caused to pastoralist societies by desertification is one of the causes of the current war in Darfur.” The pastoralists were forced to move south to find arable land as the boundaries of the desert shifted southward due to declines in precipitation. In northern Darfur, the annual amount of rainfall has dropped by 30 percent over 80 years. As demand increases, in line with projected growth rates in the human and livestock populations, climate change is expected to aggravate conflicts in an area with an extensive history of local clashes over agricultural and grazing land.<sup>9</sup>

In one case reported by UNEP, the camel-herding Shanabla tribe had migrated southward into the Nuba mountains as a result of northern rangeland degradation, and the Nuba population “expressed concern over the widespread mutilation of trees due to heavy logging by the Shanabla to feed their camels, and warned of ‘restarting the war’ if this did not cease.” While the primary dri-

vers of the Darfur crisis include a range of social, political, and economic issues, episodes like this one demonstrate how declining resources can fuel an environment of competition and mistrust in regions plagued by conflict.<sup>10</sup>



Andrew Heavens

*People frantically pull water from a well just filled by a tank truck with water from a nearby borehole, in the Oromiya region of Ethiopia during a severe drought, 2006.*

Bangladesh is considered to be among the countries at highest risk from the effects of climate change, as floods, monsoons, tropical cyclones that increase in intensity, and sea level rise from melting glaciers

threaten the population, particularly in coastal areas. Abnormally high destruction was already witnessed in the flood of 1998, when two thirds of the country was inundated. The flood led to more than 1,000 deaths, the loss of 10 percent of the country's rice crop, and 30,000 people being left homeless.<sup>11</sup>

Continued climate change may prevent future recovery in Bangladesh, since small islands in the Bay of Bengal are home to approximately 4 million people, many of whom will need to be relocated as the islands are rendered uninhabitable by rising sea levels. Conflict over territorial borders already plagues the region, and the resettlement of vulnerable populations threatens to add to these conflicts. The deteriorating socioeconomic and political situation in Bangladesh is already a security concern for other nations; following the U.S. invasion of Afghanistan in 2001, Taliban and Islamic extremists relocated to Bangladesh. Increasing extremism threatens to further destabilize the country as environmental stress combines with socioeconomic factors to weaken the government's ability to cope with multiple sources of instability.<sup>12</sup>

As the Darfur and Bangladesh cases demonstrate, the threat posed to security and stability at the global, state, and individual levels from environmental degradation is increasingly evident, despite academic criticism about the lack of precise evidence linking climate change to violent outcomes. Yet academic research suffers from improperly scaled national aggregate data, the challenge of capturing complex causal models, and the difficulty of accounting for the time-lagged effects of climate change. These constraints should not excuse policymakers who fail to address increasingly visible security challenges.

While preparing for the effects of climate change is receiving more attention through strategies of mitigation and adaptation, the developing world remains most at risk from the consequences of temperature rise—and it has the least access to financial, technical, and human resources to implement preventive measures. As threats to stability and security are increasingly seen to transcend political borders, climate change presents clear security challenges for industrial nations as well as for the most volatile or vulnerable regions of the world.

2 0 0 9

# STATE OF THE WORLD

*Into a Warming World*

To purchase the complete *State of the World 2009* report  
with endnotes and resources, please visit  
[www.worldwatch.org/stateoftheworld](http://www.worldwatch.org/stateoftheworld).

To purchase bulk copies, contact Patricia Shyne at 202-452-1992,  
ext. 520, or [pshyne@worldwatch.org](mailto:pshyne@worldwatch.org).

