

Climate Change and Energy Security as Military Issues

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In his first major speech after taking office in 2007, UN Secretary-General Ban Ki-moon said there was an urgent need to reframe the debate on climate change from an environmental to a development and security issue, and that it would be one of his top priorities as secretary-general.¹ Six weeks later the UN Security Council held its first debate on climate change and security. The evening before, then UK Foreign Secretary Margaret Beckett, who was to chair the debate, gave the Annual Winston Churchill Memorial Lecture in New York. She called the security implications of climate change 'a gathering storm' – the title of Churchill's history of the build-up to world war in the 1930s.²

This high-level debate was a reflection of an emerging consensus among analysts and policymakers that climate change posed a real security threat – if not, strictly speaking, a direct military threat, but rather a threat to human, economic and systemic security, to which militaries, like the rest of society, would have to respond, and which militaries might or might not be able to mitigate. The year 2007 also saw the release of the Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC).³ Former US Vice President Al Gore, author of the 2006 best-seller *An Inconvenient Truth*, and the IPCC authors were jointly awarded the 2007 Nobel Peace Prize. There were also reports from at least four major security- or international-affairs think tanks on the question of climate change and security.⁴ Ban Ki-moon and Margaret Beckett were joined by a growing

list of national and international leaders, among them French President Nicolas Sarkozy, UK Defence Secretary John Reid, Australian Prime Minister Kevin Rudd, EU foreign-policy chief Javier Solana, European Commissioner for External Relations Benita Ferrero-Waldner and Lord Nicholas Stern, author of a review of the economics of climate change commissioned by the UK Treasury.⁵

The principle concept behind this emerging consensus is that climate change will act – and indeed is already acting – as a ‘threat multiplier’, a concept introduced into the debate in the report from the CNA Corporation, published, with the oversight of a panel of 11 retired generals and admirals and under the direction of a former undersecretary of defense for environmental security. They concluded that projected climate change over the next 30–40 years posed a serious threat to US national security. It would, said the report, act as a ‘threat multiplier’ for instability in volatile regions and add to tensions in more stable regions.⁶ The EU/EC report on ‘Climate Change and International Security’ from Solana and Ferrero-Waldner concluded that climate change was ‘a threat multiplier which ... threatens to overburden states and regions which are already fragile and conflict prone’.⁷ The 2010 US Quadrennial Defense Review concluded that ‘climate change could have significant geopolitical impacts around the world, contributing to poverty, environmental degradation, and the further weakening of fragile governments. Climate change will contribute to food and water scarcity, will increase the spread of disease, and may spur or exacerbate mass migration. While climate change alone does not cause conflict, it may act as an accelerant of instability or conflict, placing a burden to respond on civilian institutions and militaries around the world. In addition, extreme weather events may lead to increased demands for defence support to civil authorities for humanitarian assistance or disaster response.’⁸ And in his keynote speech at the VIII International Security Conference of Forte de Copabana in Rio in 2011, Brazilian General Francisco Carlos Modesto, Director of the Department for Strategic Intelligence at the Brazilian Ministry of Defence, listed climate change as one of the constellation of new and emerging challenges to global security.

Nature of the threat

There is a tendency to focus on how much hotter the world is getting as a result of increased greenhouse-gas concentrations in the atmosphere as a result of human activity. But global warming is a driver of climate change, rather than a symptom. Natural variability in the weather from year to year is still much greater than the long-term warming trend, and it will be several decades before the unambiguous impact of global warming begins to be noticeable against the backdrop of extreme events such as seasonal or multi-year droughts; heat waves and cold snaps; and storms and floods. But an increase in the frequency and severity of such extreme events is expected to be an early manifestation of man-made climate change, and there is evidence that it is happening already.⁹ And if global warming were to occur in a steady, linear fashion, it would be much easier to anticipate and adapt to its effects. It is the increased uncertainty and volatility in the climate, as much as the absolute amount of warming, that is the biggest problem in the short to medium term.

Other potential security threats that have been identified include boundary disputes and conflicts over resources. Rising sea levels are changing coastlines and swamping low-lying islands, which may eventually impact maritime territorial claims. The thinning and shrinking summer ice in the Arctic is making potentially huge resources, especially oil and gas, accessible for the first time, and will soon open new shipping routes, which will mean big changes to the geo-strategic and geo-economic balance. Climate change in the Antarctic, on the other hand, will be a longer-term problem, and in any case there is a long-standing treaty regime in place.

Through its impacts on the availability of clean water and food, the geographical pattern of disease vectors, and the stability of communities and shelter, climate change has the potential to exacerbate human insecurity and contribute directly or indirectly to political or violent conflict in weak and failing states. This means that the types of threats to international stability emanating from such states, such as transnational organised crime, terrorism, migration and so on, will be enhanced.¹⁰ The same dynamic applies in the case of the human security of the people who will be directly affected by global warming, but in this case climate change may be better described as a risk multiplier rather than a threat multiplier.

For example, climate change is one of four broad and interrelated trends threatening global food security (the others being water scarcity, competition for land and high oil prices).¹¹ The dynamics of food security are complex, but climate (or weather), as both a chronic problem and through sudden shocks, is commonly mentioned as one factor among many influencing food security in household surveys in the developing world.¹² Falling crop yields and crop failures due to reduced rainfall or availability of irrigation water are only part of the story. Some effects of climate change, such as longer growing seasons, may be positive in the short term in some regions, and there might even be a net positive effect with modest global temperature increases. The impacts will vary from region to region, however, and for the most part the regions worst affected will also be those already experiencing high levels of food insecurity and least able to compensate or adapt. Fisheries and aquaculture will be affected by ocean warming and acidification and destruction of coral reefs, while sea-level rise can result in salinisation of coastal soils and aquifers. Crop pathogens, such as wheat stem rust, particularly the virulent Ug99 strain (first identified in Uganda in 1999) that has been damaging normally resistant wheat crops in Africa, Asia and most recently the Middle East, are spreading more widely and more quickly as winters become wetter and warmer.¹³

Energy security, like food security, is bound up with climate in complex ways. The final report of the IISS Transatlantic Dialogue on Climate Change and Security concluded that the effects of climate change will add to the volatility and unpredictability of energy markets, especially given the complex interdependencies of global energy infrastructure. But, “unlike water or food security, there is not a direct link between changing climatic conditions and reduced energy security”.¹⁴ The principle threat comes from the impact of rising sea levels and increasingly frequent and severe storm surges on low-lying coastal or off-shore infrastructure. Water availability affects all aspects of energy production, from hy-



drocarbon extraction and refining to nuclear power plant cooling to hydroelectric generation to biofuel production. As climate change begins to make potentially large new sources of hydrocarbons in the Arctic accessible, there will be wide-ranging geopolitical and geoeconomic implications. But the dynamics of the global energy market are also beginning to change in response to the threat of global warming, as countries increasingly turn to low-carbon energy sources in order to mitigate long-term climate change. As energy transformation proceeds in the next few decades, in both the mature industrial economies and the emerging economies, energy production will become increasingly local or regional, but the geoeconomic balance may change as countries seize the opportunity to develop manufacturing bases for low-carbon energy technologies and to control the resources that those technologies require.¹⁵

Climate Wars?

To be sure, not all observers, academics and analysts agree that climate change poses a security threat.¹⁶ The principal objections are four-fold. Firstly, the strength of the link between conflict and environmental factors such as climate change is contested, with some empirical studies showing no link at all. Secondly, many of the studies that do show a link between climate change and conflict suggest that in the past it has been cooling rather than warming that has been the problem. Thirdly, even if the link is established, it is unclear how relevant it is to military and strategic planning, given the uncertainties of projection. And finally, many have argued that focusing on environmental conditions or changes as a driver of conflict is counterproductive, since it might be seen as absolving individuals or governments of the blame for atrocities committed during such conflicts.

The debate over the link between environmental factors and conflict is decades old, and unlikely to be resolved soon. But it is interesting to compare it with the debate over the reality of climate change itself. Climate science, and hence the current consensus on anthropogenic global warming, is firmly grounded in a consilience of method, evidence and theory.¹⁷ More specifically, the model-based projections of global warming and climate change are robust. Models differ in their specific, detailed projections, as indeed to individual runs of the same model based on slightly different starting conditions. Yet they all agree, within the limits of experimental error, on the overall warming trend; projections of climate change broadly considered are relatively insensitive to the choice of model or variables. Environmental conflict studies, on the other hand, are highly sensitive to such choices, such as how one defines war or conflict (e.g., number of deaths in a given period). Case-based studies obviate this problem, but involve subjectivities of their own. Yet there are good a priori reasons to think that the link is real, and the evidence that it is not is unpersuasive.¹⁸

Although historical precedents of climate-induced conflict, unrest and even societal collapse tend to involve global or regional cooling rather than warming, the post-industrial warming the world has already experienced is historically unprecedented. Projected global warming, even over the next few decades, leads further into uncharted territory. The rel-





evance of the historical data may also be limited because of qualitative differences between pre-industrial and industrial civilisation, and between a pre-globalised and a globalised world. Theoretical considerations also suggest that the socio-political effects induced by projected warming over the medium term will be similar to those experienced by past societies facing climate change.¹⁹

What is clear is that environmental factors are only one, and rarely the decisive, contribution to a complex interaction of other political, social and economic factors underlying conflict. Conflicts involving environmental factors occur predominantly within states, and where they do transcend state borders they tend to be sub-national rather than classic interstate conflicts. Interstate environmental issues have always tended to be resolvable through diplomacy, mediation and international law. The most pessimistic global warming projections would have to prove accurate before climate change threatened to overwhelm such mechanisms.

Practical examples

How does the concept of climate change as a security risk multiplier work in practice? Consider the case of the Darfur region of Sudan. The violence in Darfur in the past decade was the largest and latest in a series of sporadic conflicts going back to the 1980s, originating in tribal competition over access to grazing land and water. Historically, agriculturalists and pastoralists coexisted without clashing, and in fact functioned symbiotically. But population growth, together with declining productivity of agricultural land due to low rainfall and increasing losses to pests, necessitated the expansion of land under cultivation. A simultaneous deterioration of pastureland meant pastoralists needed more area

to support a growing animal population, and shifts in ecological zones due to changes in aridity affected the competition between pastoralism and agriculture in a given area. By 2007 over two million people in Darfur had been displaced, many fleeing across the border to Chad, and the number of killed and wounded has been estimated at somewhere between 200,000 and 500,000. Other countries in the Sahel experienced similar climate change, drought and environmental impacts, but different political and social conditions and actors meant that these did not lead to anywhere near the same level of violence. Climate change was insufficient on its own, but was a necessary condition, for the particular constellation of circumstances that led to the conflict. Other chains of events and conditions might have also sufficed. Climate change simply multiplied the threat.²⁰

Darfur, too, illustrates the problem of attribution of blame for conflicts or atrocities. There is no real disagreement, at root, that climate was a factor in the Darfur violence. The argument is over semantics. Those who object to calling Darfur a ‘climate-change conflict’, or reject a causal link between environmental change and violence in this case, do so because they see the influence of environmental factors as too indirect to be relevant, especially compared to the contingent actions of individuals. Yet objective evaluation of the contribution of climate change to violence is like observing a link between poverty and crime, or between global inequality and terrorism. That the link exists does not absolve the actors of responsibility for their crimes.²¹

In some cases, rather than acting as a ‘threat multiplier’, climate change may be better characterised as shifting ‘the tipping point at which conflict occurs’. The recent series of popular uprisings in the Middle East and North Africa is a good example. Global warming did not cause the Arab Spring, but it may have made it come earlier. A spike in the price of food, in part due to extreme global weather, was an important factor behind the initial protests and uprisings in Tunisia and Egypt that set off a chain reaction throughout the region. Although World Bank President Robert Zoellick described food prices as an ‘aggravating factor’ in the turmoil, rather than as the principal cause, it was a vivid illustration of the way climate change acts as a risk multiplier for insecurity both directly, through its impacts on food security, and indirectly, through the knock-on effect on political stability and the different responses of governments to the unrest. The range of outcomes, from relatively peaceful democratic transitions to autocratic repression to civil war and foreign interventions, illustrates the unpredictable nature of the risks.²²

Some of the world’s most fragile states are in sub-Saharan Africa. This is also a region where some of the worst effects of climate change will be (and are already being) felt. But since they face so many other problems, it is difficult for climate change to really make things worse. At the other end of the continuum are the wealthier powers such as the United States or Europe, which will be able to adapt to climate change except in the worst cases. Ironically, these are the countries which bear the greatest historical responsibility for global warming. In between are countries such as Brazil, or many others in Latin America and elsewhere, whose adaptive capacity will be increasingly put under strain by the changing climate, and which may find their growth and their stability significantly curtailed.

Military and Strategic Considerations

The nature, or at least the relative mix, of missions for many nations' armed forces will change as a result of the changing climate within the time horizon of force planning and acquisition programmes. An increase in humanitarian crises from extreme weather events is already putting strain on militaries, which, as General Modesto pointed out at the VIII Forte de Copacabana conference, are often the only organisations prepared to respond quickly. The US military has regularly deployed troops both externally and internally in the aftermath of hurricanes in the Caribbean and Gulf of Mexico in the last 20 years, and the international responses to the 2004 Indian Ocean tsunami, the 2005 Kashmir earthquake, Cyclone Nargis in Myanmar in 2008, and the earthquake in Haiti in January 2010 all involved military resources and personnel from many developed and developing countries. While most of these disasters were not climate related, this sort of disaster response is likely to be increasingly needed as the climate changes. Increased weather volatility and sea-level rise threatens military infrastructure and affects operations. As a second-order impact, carbon-pricing mechanisms or binding emissions ceilings that might be established to mitigate global warming will have a disproportionate impact on militaries, which are huge energy consumers. The flip side is that new low-carbon technologies will benefit military forces, freeing them from or reducing dependency on long, resource-intensive and difficult to defend supply lines. There are other second-order impacts not directly related to the military. For example, reduced demand for oil or natural gas could damage the economies of producing states, and an increased reliance on nuclear power for electricity generation could increase the risk of proliferation, terrorism or accidents such as Fukushima.

The inherent uncertainty of climate projections is of a part with a more general problem of uncertainty in strategic planning, and defence planning in particular. On the one hand, the future is impossible to predict; on the other, without some guidance as to what is likely to happen planning becomes impossible too. Rather than focus on particular cases, planners need to expect the unexpected, and focus on an increasing range of variability rather than simply the direction of the underlying trend.²³

With the three main sources of uncertainty in climate projections – models, scenarios and annual variability – are important over different timescales. Over the short term, and particularly for regional or smaller-scale projections, choice of scenario matters little and variability predominates, while over the longer term scenario and model become critical.²⁴ Although the long-term warming trend is already distinguishable against annual variability globally and in most regions of the world, precipitation trends, which depend critically on models, are not. In many areas, particularly Latin America and Africa, even the direction of the trend by the end of the century cannot be projected with confidence.²⁵

When it comes to state instability and the aggregate threat it poses to international order, climate change is indeed a threat multiplier. But it is not necessarily any more so than any of the other causes or contributors to instability – no single factor is either necessary or sufficient. What makes current climate change unique is that it is a new variable; other

causal factors – including natural climate variation – have always been with us, but human-induced warming is directional, accelerating and (on the timescales that matter) irreversible. There will undoubtedly be climate-related conflicts over the next several decades, as there have been in the past. Given the time frame there may be fewer than the analytical consensus would have it, but it is necessary to be prepared to respond directly through military or humanitarian interventions and to cope with social and political consequences.

How important climate change is, relative to all the other global security problems, is difficult to say. As a rough metric, the IISS journal *Survival: Global Politics and Strategy* has devoted about 5% of its space to climate change in the past five years. How bad the consequences of global warming will be, how soon they will materialise and how quickly they will increase is highly uncertain. There are too many unknowns. At one extreme, on the most optimistic of assumptions and models, we could face climate change no more severe than that already experienced in the last century. Although this has had real strategic consequences, it has gone for the most part unnoticed, and would not be a game changer for the twenty-first century. At the other extreme lie the catastrophic scenarios, where global temperatures quickly, significantly and irreversibly exceed the level where global systems are able to cope. There are good reasons to think that the catastrophic scenarios are more likely than the complacent ones. This is true with regard to the rate of climate change as well, a factor of critical importance to policymakers who must assess the urgency and extent of necessary responses. Disagreements among analysts as to the overall security and geopolitical impact of climate change stem less from differences in method than from the assumptions they make with regard to the uncertainties and the relative weight they place on different projections. Policymakers, of course, have in turn to weigh these assessments against the costs of taking preventive action.

Notes

- ¹ Ban Ki-moon, "Secretary-General's Address to UNIS–UN Conference on Climate Change", New York, 1 March 2007, <http://un.org/apps/sg/sgstats.asp?nid=2462>.
- ² Margaret Beckett, "Climate Change: 'The Gathering Storm'", Annual Winston Churchill Memorial Lecture, British American Business Inc., New York, 16 April 2007, available at <http://collections.europarchive.org/tna/>; for her remarks at the Security Council debate itself, see Beckett, "Opening Remarks", UN Security Council Debate on Energy, Climate and Security", New York, 17 April 2007, available at <http://collections.europarchive.org/tna/>.
- ³ Intergovernmental Panel on Climate Change, *Climate Change 2007*, 3 vols (Cambridge: Cambridge University Press, 2007).
- ⁴ CNA Corporation, *National Security and the Threat of Climate Change* (Alexandria, VA: The CNA Corporation, 2007), [http://securityandclimate.cna.org/report/National Security and the Threat of Climate Change.pdf](http://securityandclimate.cna.org/report/National%20Security%20and%20the%20Threat%20of%20Climate%20Change.pdf); Joshua W. Busby, *Climate Change and National Security: An Agenda for Action*, Council Special Report no. 32 (New York: Council on Foreign Relations, 2007); Kurt M. Campbell et al., *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change* (Washington DC: Center for Strategic and International Studies and Center for a New American Security, 2007); "Climate Change: Security Implications and Regional Impacts", *Strategic Survey 2007* (Abingdon: Routledge for the IISS, 2007), pp. 46–69.
- ⁵ "France Warns Climate Change Driving War, Hunger", AFP, 18 April 2008; Ben Russell and Nigel Morris, "Armed Forces are Put on Standby to Tackle Threat of Wars over Water", *Independent*, 28 February 2006; "Global Warming Threatens Asia-Pacific Security, Warns Australian PM", *Guardian*, 10 September 2008; Council of the European Union, *Climate Change and International Security*, Report from the Commission and the Secretary-General/High Representative to the European Council, 7249/08, Brussels, 3 March 2008; "Expert: Climate Change Could Mean 'Extended World War'", AP, 23 February 2009; Nicholas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge: Cambridge University Press, 2006).

- ⁶ CNA Corporation, *National Security and the Threat of Climate Change*.
- ⁷ Council of the European Union, *Climate Change and International Security*.
- ⁸ US Department of Defense, *Quadrennial Defense Review Report*, February 2010, p. 84, available at <http://www.defense.gov/QDR>.
- ⁹ "Global Agriculture and Food Security", *Strategic Survey 2011* (Abingdon: Routledge for the IISS, 2011), pp. 109–119; Dim Coumou and Stefan Rahmstorf, "A Decade of Weather Extremes", *Nature Climate Change*, 25 March 2012, <http://www.nature.com/nclimate/journal/vaop/ncurrent/pdf/nclimate1452.pdf>.
- ¹⁰ CNA Corporation, *National Security and the Threat of Climate Change*. For a thorough exploration of these issues, see Jeffrey Mazo, *Climate Conflict: How global warming threatens security and what to do about it*, Adelphi 409 (Abingdon: Routledge for the IISS, 2010).
- ¹¹ "Global Agriculture and Food Security", *Strategic Survey 2011*.
- ¹² *Ibid.*, p. 122.
- ¹³ "Human Security and the Changing Climate", *Strategic Survey 2011* (Abingdon: Routledge for the IISS, 2011), pp. 119–26.
- ¹⁴ The IISS Transatlantic Dialogue on Climate Change and Security, "Report to the European Union", January 2011, p. 21, available at <http://www.iiss.org/programmes/climate-change-and-security/transatlantic-dialogue-on-climate-change-and-security/>.
- ¹⁵ *Ibid.*, pp. 20–23.
- ¹⁶ For the best synthesis and summary of the contrarian argument see Bruno Tertrais, "The Climate Wars Myth", *Washington Quarterly*, vol. 34, no. 3, Summer 2011, pp. 17–29.
- ¹⁷ For a detailed discussion of scientific method in the context of climatology, see Oreskes, "The Scientific Consensus on Climate Change: How Do We Know We're Not Wrong?", in Joseph F.C. DiMento and Pamela M. Doughman (eds), *Climate Change What It Means for Us, Our Children, and Our Grandchildren* (Cambridge, MA: MIT Press, 2007), pp. 79–93.
- ¹⁸ For a more detailed discussion of these issues see Mazo, *Climate Conflict*. More recent studies not covered in that discussion include Solomon M. Hsiang, Kyle C. Meng and Mark A. Cane, 'Civil Conflicts are Associated with the Global Climate', *Nature*, vol. 476, 25 August 2011, pp. 438–40; David D. Zhang et al., "The Causality Analysis of Climate Change and Large-Scale Human Crisis", *Proceedings of the National Academy of Sciences*, vol. 108, no. 42, 18 October 2011, pp. 17,296–301; and the introduction and papers in the special issue of *Journal of Peace Research*, "Climate Change and Conflict", vol. 49, no. 1, January 2012.
- ¹⁹ See Mazo, *Climate Conflict*.
- ²⁰ *Ibid.* pp. 73–86.
- ²¹ For more detailed discussion of this point see *ibid.*, pp. 34–5, 81–6.
- ²² Sarah Johnstone and Jeffrey Mazo, "Global Warming and the Arab Spring", *Survival: Global Politics and Strategy*, vol. 53, no. 2, April–May 2011, pp. 11–17.
- ²³ For nuanced discussions of the problem of uncertainty for planners see Michael Fitzsimmons, "The Problem of Uncertainty in Strategic Planning", *Survival*, vol. 48, no. 4, Winter 2006–07, pp. 131–46; Colin Gray, "Coping with Uncertainty: Dilemmas of Defense Planning", *Comparative Strategy*, vol. 27, no. 4, July 2008, pp. 324–31.
- ²⁴ Ed Hawkins and Rowan Sutton, "The Potential to Narrow Uncertainty in Regional Climate Predictions", *Bulletin of the American Meteorological Society*, vol. 90, no. 8, August 2009, pp. 1,095–1,107.
- ²⁵ Intergovernmental Panel on Climate Change, *Climate Change 2007*, vol. 1, pp. 854–7.