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# Toward Disaster Security

August 2005 began with news headlines of continued violence in the Middle East, US casualties mounting in Iraq, and the dramatic rescue of Russian sailors from the stricken submarine in the Pacific Ocean. The summer had been fixated on violent conflict, from the July bombings in London and Cairo to nuclear arms talks with North Korea. What most Americans remember about that summer, however, were the images from late August of Hurricane Katrina and its aftermath in New Orleans and nearby regions. The news reports on CNN International showed a United States where flooding had destroyed a large part of an iconic city, where thousands of people were trapped in a large sports stadium, and where bodies were floating in the muddy floodwaters.[1] The contrasts with the news reports coming from Iraq could not be more striking, and it soon became evident that there was a connection between the domestic disaster in the United States and the country's overseas military involvement. Many of the National Guard troops and their helicopters were not available for rescue and disaster relief, as they had been deployed to Iraq and Afghanistan.

The US invasion of Afghanistan in 2001 was widely supported both domestically and internationally. While the 2003 invasion of Iraq was far less popular, it was Hurricane Katrina that most severely undercut confidence in the administration of President George W. Bush. Whose security was being protected? Were the Americans prepared for more such disasters, and would those worsen in the future? Warnings concerning climate change and global warming had been officially discussed since the 1980s, but there was a growing sense in

[1] I (Briggs) was in Budapest, Hungary, that year with my wife, Tracy, while Miriam Matejova was living a short distance away in Bratislava, Slovakia. We would not actually meet until six years later, in Wales and then Ottawa. The images of Hurricane Katrina that Tracy and I saw in 2005 were pivotal in motivating a shift in our work from risk governance and management to environmental security.

some communities that climate-related hazards would grow worse. It was also not only the human suffering in cities like New Orleans that was noticeable. In the first days of Hurricane Katrina, gasoline prices in the United States skyrocketed as oil production and processing operations in the Gulf Coast region were interrupted or shut down.[2] In the aftermath of the storm, it became evident that the disaster risks had been known. The US Army Corps of Engineers had warned about possible flooding in the lower wards of New Orleans, climate scientists had warned about potential strengthening of tropical storms from warmer waters, and ecologists and geologists had warned about the impacts of human development on potential tidal surge in the Mississippi Gulf region. Yet, much like what was noted in the conclusions of the 9/11 Commission Report (released in 2004), the US government had failed to "connect the dots" – it had not tied together disparate (and sometimes weak) signals, it had relied on historical data that ignored both environmental and human changes, and it had failed to plan for the necessary disaster mitigation and response.[3] Environmental changes had been accelerating, and we seemed to be unprepared for what the future would look like.

Concerns over environmental changes have been growing in both scholarly and policy circles. Severe consequences of environmental problems have been "depicted as comparable to or even greater than those of military conflict."[4] An increasing number of natural disasters are transboundary issues, affecting more than one country simultaneously and transcending the boundaries of administrative levels. Many of them have been becoming more frequent and more severe due to climate change, which is expected to exacerbate heat waves, droughts, floods, cyclones, and tropical as well as polar storms. Negative health impacts, food insecurity, loss of assets, and human casualties are all likely consequences of these environmental events that are now increasingly regarded as existential risks.

Historically, human societies have been dependent on their ability to predict when certain environmental conditions occur, from the timing of food harvests and ice fishing to choosing the location and type of dwellings. However, now that extreme weather and climate are becoming more of the norm, our latent

[2] Gene Laverty, "Oil, Gas May Soar as Storm Shuts US Gulf Production," *Bloomberg*, August 28, 2005.

[3] Tom Davis, "Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina," Final Report, US House of Representatives, February 15, 2006; Robert R. M. Verchick, "Risk, Fairness, and the Geography of Disaster," *Issues in Legal Scholarship* 6, No. 3 (2007): 1–33.

[4] Mutiah Alagappa, "Rethinking Security: A Critical Review and Appraisal of the Debate," in *Asian Security Practice: Material and Ideational Influences*, ed. Mutiah Alagappa (Palo Alto, CA: Stanford University Press, 1998), 44.

predictive abilities are unable to cope with new and changing risks. The predominant approaches in disaster risk assessment force planners to rely heavily on available data and historical precedence. Yet, some combinations of factors are impossible to calculate probabilistically.[5] Because planners tend to avoid venturing into the realm of uncertainty caused by lack of historical precedence, they limit disaster planning to simplified models and thus consideration of fewer hazards. The resulting uncertainty can lead to paralysis in adapting to new conditions. In this book, we present some practical solutions to this and other problems in disaster risk assessment.

Our intention is not to provide a template for predicting disasters but to explain how lessons from the intelligence and military communities can help in preparing for them. Of course, many lessons have already been learned from the past, such as in contingency planning and disaster response, but today many countries face ever-increasing and accelerating pressures due to shifts in demographics, resource use, and technology as well as climate change. In light of these new challenges, the purpose of this book is threefold: (1) to identify weaknesses of traditional risk assessment approaches as they apply to extreme environmental events and complex disasters, (2) to explain one of the new approaches – complex scenario planning – in order to illuminate new energy and environmental security risks and improve our understanding of disasters and security, and (3) to discuss the lessons learned from several years of developing and applying scenario planning in order to inform and improve current disaster planning practices.

In the following chapters, we explain the entire process of developing and applying planning scenarios for energy and environmental risks, from open-source collection of emerging scientific data and construction of new scenarios to their application in policy and military planning (both strategic and operational) and use in military training. As the breadth of potential topics for energy and environment is exceedingly vast, a central focus of the book is on climate change–related risks as a background driver of change, with water as the other defining focus to tie together disparate issues related to disaster risks. Drawing on the experiences of the US military and intelligence sectors, this book is intended to provide a solid overview of the lessons learned on energy and environmental security (EES) from 2007 to the present. Major disasters can be assessed using relatively modest means, allowing planners and policy makers to prepare for highly uncertain future events. The book addresses concepts such

[5] See, e.g., US Department of Homeland Security (DHS), "The Strategic National Risk Assessment in Support of PPD 8: A Comprehensive Risk-Based Approach toward a Secure and Resilient Nation," December 2011, www.dhs.gov/xlibrary/assets/rma-strategic-national-risk-assessment-ppd8.pdf.

as scenario planning, integrating scientific data into risk assessments as well as ways to deal with uncertainty and risk.

This chapter provides some necessary background to EES literature and concepts. Through historical examples, we discuss long-standing practical understandings of energy and environmental security (linked predominantly to military considerations) as well as the prevailing academic research and assumptions behind military and intelligence programs in the same field. Specifically, we focus on the US military perspective and recent programs developed in response to changing environmental conditions.

## Approaches to Energy and Environmental Security

Our work originates in the academic fields of geography and political science, particularly the translation of scientific data into policy decisions. We draw on critical geography and the work of scholars, such as Simon Dalby, who recognize the limitations in using traditional international relations concepts to describe the nature of environmental security risks. Our focus on science-policy interactions has been inspired by scholars, such as Kristin Shrader-Frechette, who call attention to the nature of scientific uncertainty and the related challenges faced by policy makers.

Some of our approaches have been addressed in different publications. For example, Ron Suskind's *The Way of the World* (2008) described the new post-9/11 security challenges faced in Washington, DC, noting that the Director of Intelligence and Counterintelligence at the US Department of Energy, Rolf Mowatt-Larssen, directed some funding toward nontraditional risks in the second half of the 2000s.[6] In 2007, despite political opposition, the CNA Corporation (namely, Sherri Goodman) published a national security report that emphasized the multidimensional impacts of climate change.[7] More recently, groups such as the Center for Climate and Security have emphasized the military's interest in climate-related security risks.[8] None of these publications, however, has gone into detail into how and why the military and intelligence communities have created planning scenarios for issues like abrupt climate change. The media portrayal of these efforts (as well as much of academic research) have focused on climate change sparking conflict. Yet,

[6] Ron Suskind, *The Way of the World: A Story of Truth and Hope in an Age of Extremism* (New York: HarperCollins, 2008).
[7] The CNA Corporation, *National Security and the Threat of Climate Change* (Alexandria, VA: The CNA Corporation, 2007).
[8] See their reports at https://climateandsecurity.org/reports/.

the real motivations and planning scenarios are much more nuanced and, in many cases, focus on risks other than military conflict.

The broader academic literature on risk assessment approaches is substantial, particularly with respect to environmental issues.[9] However, complex risks, such as those stemming from environmental disasters, are seldom addressed in relation to security, international affairs, and energy politics. A general shortcoming of the prevailing literature is the reliance on established methodologies for assessing disasters (e.g., extrapolation of probability from historic events), which is often an obstacle to envisioning unique events and risks. Few publications deal with both energy and environment comprehensively, with, perhaps, the exception of Michael Klare's book on resource wars.[10] Yet, Klare's work falls into a larger literature of environmental security that dates to Homer-Dixon's work in the 1990s, premised on showing how resource scarcities lead to conflict. Similar work has been done by Andrew Price-Smith on disease in Africa, the University of Texas consortium on climate change in Africa, and the Strauss Center at the University of Texas.[11] Our approach is quite different, both in specifically not focusing on conflict as an end point[12] and in sidestepping the academic science pressure to show causal links between variables. We also shift emphasis from the world's developing regions to industrialized areas and their vulnerabilities to energy and environmental security risks.

Our backgrounds draw from the lessons of the academic study of environmental security, mixed with energy security, intelligence studies, and military planning. Traditionally, these have not been easy mixes. While in the post–World War II period, energy and environmental security have been viewed by both scholars and practitioners as more or less separate concepts, we maintain not only that the energy and environmental systems are inherently linked but also that the security risks associated with them cannot be adequately addressed without seeing them as such.

[9] See the Routledge and Earthscan series, including authors and editors such as Ragnar Lofstedt and Paul Slovic.

[10] Michael Klare, *Resource Wars: The New Landscape of Global Conflict* (New York: Henry Holt, 2002).

[11] Andrew Price-Smith, *Contagion and Chaos: Disease, Ecology, and National Security in the Era of Globalization* (Cambridge, MA: MIT Press, 2009); Idean Salehyana and Cullen S. Hendrix, "Climate Shocks and Political Violence," *Global Environmental Change* 28 (2014): 239–50. See also Strauss Center's research on Climate Change and African Political Stability available at www.strausscenter.org/ccaps/.

[12] There is an environmental peacemaking literature, developed partly in opposition to the scarcity-conflict theses, which also addresses topics such as disaster diplomacy (Ilan Kelman, Michael Renner), peace parks (Geoffrey Dabelko), and international cooperation (Ken Conca).

## Energy and Environmental Security: The Past, the Present, and the Future

*Security*, in its simplest meaning, refers to the basic need of human societies for protection from danger. On the international stage, the term has long been understood as security for states, principally in military terms.[13] However, since the 1970s, the concept has undergone dramatic redefinitions, moved away from a narrow military focus, and eventually split into two distinct understandings of security: security for states and security for people (i.e., human security).[14] Different forms of security have thus revolved around claims about referent objects (i.e., an object that is viewed as existentially threatened and has legitimate claim to survival). While state security focuses on the concept of sovereignty, human security is organized around the concept of human life and dignity.[15] The shift from the traditional military dimension of security to nontraditional risks is most prominently captured in the theory of securitization developed by the Copenhagen School and its critics.[16] These scholars consider environmental security as one of the five general areas of nontraditional security where the focus changes from state sovereignty as the referent object to human dimensions, and specifically as they relate to the environment and environmental risks.[17]

Energy security has been viewed differently – originally in terms of disruptions to oil supply – due either to political decisions or to uncontrollable events affecting oil production or transport facilities.[18] Recently, the concept has moved away from a single interpretation and became somewhat blurred, including anything from attempts for energy independence to protection of energy infrastructure to energy efficiency and conservation.[19] Europe, for

[13] See Charles Tilly, "War Making and State Making as Organized Crime," in *Bringing the State Back In*, ed. Peter Evans, Dietrich Rueschemeyer, and Theda Skocpol (Cambridge, UK: Cambridge University Press, 1985), 169–91; Stephen M. Walt, "The Renaissance of Security Studies," *International Studies Quarterly* 35, No. 2 (1991): 211–39.

[14] Barry Buzan, "Rethinking Security after the Cold War," *Cooperation and Conflict* 32, No. 1 (1997): 5–28; Richard Ullman, "Redefining Security," *International Security* 8, No. 1 (Summer 1983): 129–53. See also Astri Suhrke, "Human Security and the Interests of States," *Security Dialogue* 30, No. 3 (1999): 265–76; Roland Paris, "Human Security: Paradigm Shift or Hot Air?," *International Security* 26, No. 2 (2001): 87–102.

[15] Scott Watson, "The 'Human' as Referent Object? Humanitarianism as Securitization," *Security Dialogue* 42, No. 1 (2011): 5.

[16] See Shahar Hameiri and Lee Jones, "The Politics and Governance of Non-Traditional Security," *International Studies Quarterly*, No. 1 (2012): 3.

[17] Mely Caballero-Anthony and Ralf Emmers, "The Dynamics of Securitization in Asia," in *Studying Non-Traditional Security in Asia: Issues and Trends*, ed. R. Emmers, M. Caballero-Anthony, and A. Acharya (Singapore: Marshall-Cavendish Academic, 2006).

[18] David Robinson, "Energy Security Revisited," *Oxford Energy Forum*, No. 100 (May 2015): 39–42.

[19] Christian Winzer, "Conceptualizing Energy Security," *Energy Policy* 46 (2012): 36–48.

example, is facing energy security risks due to its dependence on Russia's natural gas, while Russia (as well as other energy-exporting countries) views energy security in terms of security of demand.[20] Taking these differences into consideration, Christian Winzer offers a workable definition of energy security, viewing it as "the absence of, protection from or adaptability to threats that are caused by or have an impact on the energy supply chain."[21] Such risks, of course, may stem from environmental hazards. As seen in the historical examples below, environmental and energy security considerations are closely linked, and the recent separation of the two concepts is rather artificial.

## Energy and Environmental Security in the Nineteenth and Early Twentieth Centuries

Prior to the oil shocks of the 1970s, energy considerations were inextricably linked to the natural environment in military and security planning, in large part because of the role of food. For example, during the Napoleonic wars of the early nineteenth century, all transport of cargo, food, artillery, and ammunition relied on animals, which themselves required an extensive food train. Depending on distance, for example, if six oxen were needed to transport one artillery piece, they would need food that itself required eight horses to transport, while the horses themselves would require an additional four horses to transport their own food, and so on. In many ways, the same logistical trains still exist today, and transporting either a liter of water or a gallon of aviation fuel to a forward operating base in Afghanistan can be both enormously expensive and complex. These modern logistical challenges are still often seen as removed from most environmental conditions. In earlier times, armies had to be acutely aware of the availability of food and water as they operated on campaigns.

During the Peninsular Wars between France and Britain in Spain and Portugal in the early 1800s, attention to logistics in the natural environment may have been decisive in the outcome of the conflict. The British, investing in complex and expensive logistical support under General Arthur Wellesley (later known as the Duke of Wellington), were careful to import necessary equipment and materiel, while reimbursing locals for any food bought or used. This helped engender support among locals both in the areas in which conflict was occurring and in the rear areas along the coasts. The French, in contrast, directed their troops largely to live off the land, taking whatever food and

[20] Daniel Yergin, "Ensuring Energy Security," *Foreign Affairs* 85, No. 2 (2006): 71.
[21] Winzer, 41.

materiel they deemed useful or necessary. This practice was dangerous during times when food was not readily available, and it quickly bred resentment among locals whose livelihoods or savings were destroyed. The modern term *guerilla,* referring to an insurgent or freedom fighter, was derived from Spanish partisans fighting against the French forces. These rearguard actions were highly detrimental to French operations.

Other examples are perhaps even more obvious, such as Napoleon's ill-fated invasion of Russia during the winter of 1812–13. Like the German Wehrmacht more than a century later, severe cold in the winter conditions of Russia left armies ill prepared and unable to operate. Some argue that an outbreak of the disease typhus was also instrumental in ravaging Napoleonic forces.

Whatever the specific causes, these campaigns are well remembered as being enormously harmed by adverse environmental conditions. Although cold weather is perhaps more easily remembered and better depicted in visualizations of the conflict, for armies, diseases have always been a constant concern factor – from the effects of malaria on earlier Crusaders in the Middle East and later colonial armies in Africa and Asia to the ravaging effects of yellow fever on British forces in the Caribbean. It is little coincidence that some of the most preeminent institutes for researching tropical disease medicine are located in the former colonial capitals of London, Paris, Brussels, and Berlin. To some early geographers, the ability to overcome diseases like malaria was inextricably linked to the ability of the British Empire to maintain colonial power in far-flung areas of the world.

More recent understandings of environmental security lend at least some credit to other military concerns, namely, of the air forces and navies. Meteorology became a professional science during the Second World War, led by the US Army Air Forces, who desperately needed both accurate prediction of severe weather systems and increased knowledge of high-altitude winds for its new bombers. Weather was a constant factor for air forces, not only in operations but also in casualties. During the Solomon Islands Campaign in 1942–45, the US Army Air Forces lost nearly half its pilots due to severe weather, not enemy actions.[22] Military concerns over environmental risks to soldiers, sailors, and airmen formed the basis of a "force protection" tradition. Advancements in meteorology facilitated US research in oceanography, which was initially led by military requirements in understanding sonar and ocean thermal layers during Cold War submarine operations.

[22] Eric M. Bergerut, *Fire in the Sky: The Air War in the South Pacific* (Boulder, CO: Westview Press, 2000).

## Energy and Environmental Security during the Cold War and the 1990s

The US lead in science during the Second World War and into the Sputnik era of the Cold War has a mixed history. On one hand, it prompted massive public investments in areas of science that would later become crucial for climate sciences. On the other hand, technological developments severely affected the natural environment and posed their own risks.

The development of nuclear technologies remains perhaps the most visible symbol of this human-made risk. The modern academic understanding of environmental security can be traced to the efforts of groups such as Physicians for Social Responsibility in the 1960s, who were concerned over atmospheric nuclear testing and the human health impacts from fallout and radiation. Carl Sagan later popularized the link between military action and climate change with his warnings of "nuclear winter," where dust and particulates from nuclear war would bring about a new ice age and kill far more people than the nuclear weapons themselves.[23] This tradition of environmental damage forms the basis for what we refer to as "reflexive risk," meaning those risks that derive from our own actions to secure other forms of security.

The 1960s also witnessed increased warnings over global environmental and demographic changes, popularized by Ehrlich's book *The Population Bomb*[24] but drawing on ideas from as early as Thomas Malthus in the late 1700s. Shaped both by local environmental damage in the 1960s and the energy shocks of the 1970s, a scarcity-conflict understanding of environmental security developed. In this view, as unavailability of natural resources and food become more common (from a combination of environmental degradation and population growth), the scarcity will drive many into violent conflict. The scarcity-conflict understanding of environmental security formed the basis for many academic debates in the 1990s, with scholars such as Thomas Homer-Dixon attempting to explain new forms of order or disorder in the world following the end of the Cold War.[25] Other scholars, such as Ken Conca and Geoff Dabelko, pointed out the lack of empirical evidence in environmental scarcity as a cause of violent conflict and focused instead on the "cooperative security" aspects of

[23] Matthew R. Francis, "When Carl Sagan Warned the World about Nuclear Winter," *Smithsonian Magazine*, November 15, 2017, www.smithsonianmag.com/science-nature/when-carl-sagan-warned-world-about-nuclear-winter-180967198/.
[24] Paul R. Ehrlich, *The Population Bomb* (New York: Sierra Club/Ballantine Books, 1968).
[25] Thomas Homer-Dixon, "On the Threshold: Environmental Changes as Causes of Acute Conflict," *International Security* 16 (1991): 76–116; Homer-Dixon, "Environmental Scarcities and Violent Conflict," *International Security* 19, No. 1 (1994): 5–40.

the environment.[26] Supporters of cooperative security, who also drew from the literature on effective disaster response, argued that environmental scarcity more often led to cooperation among different groups and could be the basis for positive political developments if framed properly following a disaster or conflict.[27]

## Climate Change, Environmental Disasters, and Environmental Security

The academic debate over the scarcity-conflict thesis had largely exhausted itself by the late 1990s. In the early 2000s, following the September 11, 2001, terrorist attacks on the USA, the environmental security debate disappeared from view. Security debates reoriented around terrorism risks, and the US and coalition invasions of Afghanistan and Iraq overwhelmed discussions in North America and Europe. Conferences for international relations scholars had few panels on environmental security, and few articles appeared discussing the topic, especially with regard to climate change, despite its increasing security risks.[28]

Throughout the 1990s, climate change (or global warming) was little discussed in reference to environmental security and future environmental risks. This was not due to lack of understanding. The basic concepts of global warming were established in the 1800s, and scientists decades ago warned that sufficient increases in greenhouse gases could raise global atmospheric temperatures through the greenhouse effect.[29] The lack of severity in warnings in the 1990s was largely due to an overabundance of caution among scientists. The large uncertainties concerning global climate models led many to conclude, at least publicly, that climate change would be gradual, with its worst effects likely not visible until late in the twenty-first century. Furthermore, earlier discussions of climate change (and even the basis for the negotiations of the UN Framework Convention on Climate Change) were based largely on the understanding that climate change would not only be gradual but would also primarily impact less developed countries in Africa and parts of Asia.

[26] Ken Conca and Geoffrey D. Dabelko, eds., *Environmental Peacemaking* (Washington, DC: Woodrow Wilson Center Press, 2002); Geoffrey D. Dabelko and David D. Dabelko, "Environmental Security: Issues of Conflict and Redefinition," *ECSP Report 1* (1995): 3–13.
[27] See Adrian Martin, Andy Blowers, and Jan Boersema, "Is Environmental Scarcity a Cause of Civil Wars?," *Environmental Sciences* 3, No. 1 (2006): 1–4.
[28] John Barnett, "Security and Climate Change," *Global Environmental Change* 13, No. 1 (2003): 7–17.
[29] See, e.g., Rupert Darwall, *The Age of Global Warming: A History* (London: Quartet Books, 2013).