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Climate Change: The Hottest Issue in Security Studies?

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Abstract

Security studies in the 21st century have broadened to encompass a variety of transnational phenomena newly defined as threats. Climate change is one of these phenomena. In theoretical terms, climate change is being securitized.

Climate change, in which man-made global warming is a major factor, is an internationally recognized phenomenon that is projected to produce dramatic, accelerating, and long-lasting human, economic, and political consequences with profound security implications. These will be most pronounced in places where the effects of climate change are greatest, particularly affecting weak states already especially vulnerable to environmental destabilization. National security establishments in the United States and elsewhere are hurriedly attempting to come to grips with climate change and how to respond to its strategic challenges.

This paper, in the context of securitization theory, human security, and sustainable security, discusses the phenomena of global warming and climate change, examines the destabilizing effects of climate change, describes how such effects are being perceived as transnational threats to security, and argues that securitization of climate change is necessary, timely, and irreversible.

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Keywords: climate change, global warming, securitization, human security, sustainable security, national security, transnational threats, military

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Climate change may be the hottest issue in security studies.[1] In the wide gulf between those who are convinced this is so and those who are certain it is not lies a growing body of scientific evidence over which the opposing camps pore in search of proof. At the heart of their debate are fundamental philosophical and analytical differences: not only as to whether climate change is really occurring and why, but as to whether climate change is a security issue at all.[2]

Spurred by re-conceptualizations of security, such as "human security" and "sustainable security," security studies in the 21st century are being cast broadly, like a fisherman's net flung far out on the sea, snaring an abundant catch of issues. Many of these, focusing more on the security interests of persons than states, address threats arising from transnational phenomena.[3] Climate change is one.[4]

Climate change, in which man-made global warming is a major factor, is projected to produce dramatic, accelerating, and long-lasting human, economic, and political consequences with profound security implications. These will be most pronounced in places where the effects of climate change are greatest, particularly affecting weak states already especially vulnerable to environmental destabilization. National security establishments, primarily but by no means exclusively in the United States and other Western nations, are hurriedly attempting, along with other interested parties, to come to grips with climate change, and how to respond to its strategic challenges.

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[1] It is not climate change per se, but rather the effects or consequences of climate change that are of concern.

[2] Another way of putting this, in the context of states, is whether environmental security is a national interest.

[3] Common examples include terrorism, organized crime, and pandemic disease. Claudia Aradau, "Security and the Democratic Scene: Desecuritization and Emancipation," *Journal of International Relations and Development* (2004) 7: 389. I do not mean to suggest that this expansion, "[a] 'broadening' and a 'deepening,' [as]" one author described it, did not occur until 2000. Roland Paris, "Human Security: Paradigm Shift or Hot Air?" *International Security* (2001) 26 (2): 97. For a 20th century example, see Robert D. Kaplan, "The Coming Anarchy," *The Atlantic Monthly*, February 1994, 44. Foretellingly, Kaplan wrote: "It is time to understand 'the environment' for what it is: *the* national-security issue of the early twenty-first century (emphasis in original)." and "[The environment] will be the core foreign-policy challenge, from which most others will ultimately emanate … ." Ibid.

[4] The reader should not infer that climate change falls only within the ambit of "human security" and other non-traditional notions of security. As will be seen, the effects of climate change create security challenges as important to states as to persons.

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This paper, in the context of securitization theory and the theories of human security and sustainable security, discusses the phenomena of global warming and climate change; examines the destabilizing effects of climate change; describes how such effects are being perceived as transnational threats to security, creating strategic challenges; explores sustainable security as an adaptation paradigm; suggests the important contribution to mitigating global warming that armed forces can make; and argues that securitization of climate change is necessary, timely, and irreversible.

We begin with a brief look at securitization theory and whether climate change is being securitized.

Securitization

Securitization,[5] a theory originating in what is known as the Copenhagen School,[6] describes the process by which a political issue is intentionally and purposefully recast as a security issue.[7] The underlying idea is that by tying the issue to security concerns, its proponents, who previously may have been unsuccessful in the political arena, can generate sufficient political will and marshal adequate resources to eliminate or reduce a perceived threat, which, in turn, leads to greater security.[8] In short, an issue is securitized when

[5] The choice of "securitization" points out a pitfall, when coining a term of art, in selecting a term with multiple meanings. Securitization, for example, has long had a very different meaning in the world of finance.

[6] A nice overview of the Copenhagen School and securitization theory is contained in Matt McDonald, "The Copenhagen School and the Construction of Security," *Paper presented at the International Studies Association 48th Annual Convention Held in Chicago, IL USA* 24 May 2009, http://www.allacademic.com/meta/p_mla_apa_research_citation/1/8/1/0/6/p181067_index.html (accessed 20 October 2009)

[7] See, for example, Tasneem Siddiqui, "Climate Change and Population Movement: The Bangladesh Case," presented at the conference Climate Insecurities, Human Security and Social Resilience, hosted by Centre for Non-Traditional Security Studies, S. Rajaratnam School of International Studies, Nanyang Technological University, Singapore, http://www.rsis.edu.sg?nts/Events/climate_change/session4/Concept%20paper-Tasneem.pdf; (accessed October 19, 2009). Dr. Siddiqui illustrates how effects of projected sea-level rise, principally mass migration, may cause conflict-inducing stresses.

[8] A recent illustration is suggested in "Tying climate change to nat'l security," a piece, authored by Lisa Lerer, appearing on the *Politico* website. Ms. Lerer contends that support for greenhouse gas reduction legislation in the U.S.is being garnered by "(c)limate-legislation supporters," who "are increasingly turning to national security to bolster their pitch." Lisa Lerer. "Tying climate change to nat'l security," 14 October 2009, Politico.com, available from http://www.politico.com/news/stories/1009/

actors with capability to do so move the issue out of the political arena, into the national security arena, by declaring that an existential threat compels extraordinary urgency and justifies extraordinary measures.[9]

A leading criticism of securitization theory is that it is based on subjective, not objective, threats (or, as one might say, on perception, not reality), and thus lacks substance.[10] Another criticism is that securitizing an issue is anti-democratic and self-serving, by taking the issue out of (or placing it above) the political process and entrusting (or surrendering) it to experts.[11] These criticisms and others have led to calls for de-securitization, as a means to stop an otherwise limitless (and detrimental) expansion of the security agenda.[12]

A growing number of commentators perceive that climate change is being or has already been securitized, which some view as a good and useful thing, and others do not.[13] One plausible view is that global warming and

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28249.html# (accessed October 15, 2009). "Failure to act, … [supporters] say, could weaken America's position in the world and the country's credibility among allies." Ibid. And see Associated Press, "Can climate bill be sold as national security?" 28 October 2009, available at: http://msnbc.msn.com/id/33521487/ns/us_environment, (accessed January 3, 2010).

[9] Ben Buckland, "A Climate of War? Stopping the Securitisation of Global Climate Change," International Peace Bureau, Geneva (2007). available at: http://ipb.org/i/pdf-iles/A_Climate_of_War_Stopping_the_Securitisation_of_Climate_Change.pdf; (accessed October 26, 2009). A rough corollary of securitization is "environmentalization" of security issues. See "Climate Change—a New Security Issue?" The *Finnish Institute of International Affair,* available at: http://www.upi.fiia.fi/en/event/160, (accessed 19 October 2009.)

[10] Olav V. Knudsen, "Post-Copenhagen Security Studies: Desecuritizing Securitization" Security Dialogue (2001) 32(3): 355-368. (Oslo: International Peace Research Institute, 2008), http://sdi.sagepub.com/cgi/reprint/32/3/355 (accessed October 21, 2009).

[11] Claudia Aradau, "Security and the Democratic Scene: Desecuritization and Emancipation," *Journal of International Relations and Development* (2004) (7)4: 394.

[12] Ibid., 393.

[13] For example, Michael Renner, "Worldwatch Perspective: Security Council Discussion of Climate Change Raises Concerns About 'Securitization' of Environment," Worldwatch Institute, 2007, available at: http://www.worldwatch.org/node/5049; (accessed October 19, 2009); Oli Brown, Anne Hammill, and Robert McLeman, "Climate Change as the 'New' Security Threat: Implications for Africa," *International Affairs* (2007) 83(6): 1141; Brzoska, M. "Securitization of Climate Change and the Power of Conceptions of Security" Paper presented at the annual meeting of the ISA's 49th Annual Convention, Bridging Multiple Divides, San Francisco, CA, USA, 2008-03-26, available at: from http://www.allacademic.com/meta/p253887_index.html, (accessed March 12, 2010). Brzoska argues the interesting point that the perceived intractability and enormous cost of responding to climate change encourage military buildup. Not surprisingly, not all commentators agree that securitizing climate change

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climate change, first identified in the 1970s[14] but hardly noticed until the 1990s, were shunted aside for a combination of political, economic, and scientific reasons by an international system dependent on fossil fuels and unwilling to shed its carbon-based economy.[15] Then in 1992 came the United Nations Framework Convention on Climate Change (UNFCCC), a treaty to reduce global warming, to which 192 countries, including the United States, are parties. Next followed the 1997 Kyoto Protocol, the unrealized intent of which was to commit countries to air emission reductions that the 1992 treaty merely encouraged.[16] UNFCCC's 15th Conference of the Parties in Copenhagen, in December 2009 (COP 15), promised much but quickly dissembled into discord, producing little.[17] The

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makes good sense. See, for example, Buckland, "A Climate of War?," supra. Buckland contends that climate change is a threat to human security, but because it is unlikely to lead to violent conflict, is no threat to national security, and therefore should remain in the political arena. Another perspective is that securitizing climate change actually decreases the "immediate costs of climate change," by postponing them, thereby "driving up the long-term costs. Ross Rustici, "The Cost of the War on Climate Change," *The Atlantic Council Home Page*, 24 August 2009, available at: http://www.acus.org/new_atlanticist/cost-war-climate-change, (accessed October 19, 2009. "Instead of allocating more money and expanding the mission of the military, Congress should work on structural reforms to USAID and allocate funds to help the work adapt to some of the likely unpreventable effects of climate change." Ibid.

[14] A seminal work in environmental security is Lester R. Brown, "Redefining National Security." *Worldwatch Paper 14* (Worldwatch Institute: Washington, D.C, 1977), available at: http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/contact_storage_01/0000019b/80/35/7e/ca.pdf (accessed December 30, 2009). Brown's thesis is that the principal threat to security was increasingly non-military, arising out of resource scarcity and environmental degradation. He argued that military strength and security are not equivalencies, and that more resources should be allocated to the nonmilitary instruments of national power. Although his predictions of oil and food scarcity proved to be unfounded, many of his ideas remain relevant. What Brown did not envision, however, as this paper recommends, is how all the instruments of national power, including the military, could and should be used, in concert, to overcome nonmilitary threats to security, and achieve and preserve peace and stability.

[15] Brown et al., "Climate Change as the 'New' Security Threat: Implications for Africa." 1141.

[16] The Protocol entered into force in 2005; the United States, however, is not one of its 184 parties. It expires in 2012.

[17] President Obama's assessment was lackluster: "(W)e kind of held ground and there wasn't too much backsliding." Interview of President Barack Obama, December 23, 2009, http://www.pbs. org/newshour/bb/white_house/july-dec09/obama_12_23.html (accessed December 30, 2009). Security implications of climate change were voiced in Copenhagen, but were not prominent. Addressing the conference on December 17, 2009, U.S. Secretary of State Hillary Clinton remarked: "Climate change threatens not only our environment but our economy and our security—this is an undeniable and

treaty's broad change aspirations remain mostly unfulfilled by nonbinding greenhouse gas emission reduction targets, while evidence of global warming and climate change mounts, to the growing worry of an increasingly diverse constituency.[18]

Beginning in earnest in 2007, climate change has sparked great interest in security circles. No less a figure than United Nations Secretary General, Ban Ki Moon, in March 2007, labeled climate change "likely to become a major driver of war and conflict."[19] Then in November 2007, the United Nations' Intergovernmental Panel on Climate Change (IPCC) released its Fourth Assessment, entitled *Climate Change 2007: Synthesis Report, Summary for Policy Makers*, which details a wide range of adverse climate change-related effects.[20] These watershed events caused the level of attention paid to the security considerations of climate change to rise meteorically.[21]

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unforgiving fact." Remarks of Hon. Hillary Clinton, December 17, 2009, http://www.state.gov/secretary/rm/2009a/133734.htm (accessed December 30, 2009). The Oceanographer of the Navy, Rear Admiral Titley, during a DOD-sponsored panel "National Security Implications of Climate Change," also addressed the conference on climate change in the Arctic. Remarks of Rear Admiral Titley, December 16, 2009, https://www.news.navy.mil/ search/display.asp?story_id=50245 (accessed December 18, 2009). In his Nobel Peace Prize acceptance speech on December 10, 2009, President Obama said: "(T)he world must come together to confront climate change. There is little scientific dispute that if we do nothing, we will face more drought, famine and mass displacement that will fuel more conflict for decades. For this reason, it is not merely scientists and activists who call for swift and forceful action—it is military leaders in my country and others who understand that our common security hangs in the balance." Speech of President Barack Obama, December 10, 2009, http://www.msnbc.msn.com/ id/34360743/ns/politics-white_house/ (accessed December 30, 2009).

[18] Brown et al., "Climate Change as the 'New' Security Threat: Implications for Africa." 1141, 1144-1145.

[19] Securitizing an issue, Buckland argues, makes "it a military problem," placing it in the hands of an apparatus that may be ill-suited to ameliorating the problem. Buckland, "A Climate of War? Stopping the Securitisation of Global Climate Change." 11. While this may be true, this paper contends that climate change is not merely a security concern to individuals, and that militaries can and must play constructive roles in mitigating global warming and adapting to the effects of climate change and the conditions of instability and insecurity such effects may create.

[20] Rajendra K. Pachauri et al., eds., *Climate Change 2007: Synthesis Report, Summary for Policy Makers* (2007). Geneva: Switzerland: Intergovernmental Panel on Climate Change.

[21] In June 2007, writing for Britain's Chatham House, Cleo Paskal used maritime boundaries to demonstrate how just one aspect of climate change—sea-level rise—could spark violent controversy, for example, between the U.S.and Cuba, were the Florida

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All around the globe, in Washington,[22] London, Beijing,[23] Tokyo, and elsewhere, climate change has firmly taken root on the security agendas of major and lesser powers, of intergovernmental organizations like the United Nations, and of leading nongovernmental organizations like the Red Cross.[24] Militaries and intelligence agencies are rapidly and intently examining climate change and its implications.[25] A simple conclusion is clear: climate change is on the security agenda to stay.

Securitization of climate change is closely aligned in time and context with newer, broader security theories such as "human security" and "sustainable security." These nontraditional notions of security are, in a manner of speaking, ethnocentric, rather than state-centric. From a securitization perspective they make it easier, by lowering the threshold focus of existential threat from states exclusively to individuals, to assert that an issue like climate change belongs on the security agenda.

Keys to disappear. Cleo Paskal. "How Climate Change is Pushing the Boundaries of Security and Foreign Policy." June 2007, http://www.chathamhouse.org.uk/publications/papers/view/-/id/499/ (accessed October 19, 2009).

[22] On October 22, 2009, Mr. Stephen Seidel, Vice President for Policy Analysis of the Pew Center on Global Climate Change testified before the Select Committee on Energy Independence and Global Warming of the U.S. House of Representatives. National security was one of seven vulnerabilities to climate change he addressed. Testimony of Mr. Stephen Seidel, October 22, 2009, http://www. pewclimate.org/print/7074 (accessed December 14, 2009).

[23] See Stephen Kaufman. "U.S. Tells China Climate Change Is National Security Priority." July 28, 2009, http://www.america.gov/st/energy-english/2009/July/20090728121912esnamfuak0.5545465.html (accessed November 3, 2009); Linda Jakobson. "China and Climate Security." October 6, 2009, http://www.wilsoncenter.org/index.cfm?fuseaction=events.event_summary&event_id=553283 (accessed November 3, 2009).

[24] Chapter 4 of the Red Cross's *World Disasters Report 2009* is entitled "Climate change—the early warning." See note 69, infra. Hamburg University, one of many academic institutions to do so, conducted a climate security conference November 19–20, 2009, http://clisec.zmaw.de/Conference-program.1020.0.html (accessed January 6, 2010).

[25] The U.S. Central Intelligence Agency is opening a Center on Climate Change and National Security. Kristen Korosec, "CIA Tackles Climate Change and Its Risk to National Security," BNET Energy Blog, http://industry.bnet.com/energy/10002183/cia-tackles-security-issue-of-climate-change/ (accessed October 15, 2009); Central Intelligence Agency, "CIA Opens Center on Climate Change and National Security," https://www.cia.gov/newes-information/press-releases-statements/center-on-climate-change-and-national-security.html (accessed October 15, 2009).

Having established what securitization is, we next look at human security and sustainable security, and how climate change may fit within them.

Human Security and Sustainable Security

Human Security

Human security, a concept and a movement whose present meaning and scope is shaped most directly by the 1994 United Nations Development Programme's *Human Development Report*, attempts to bring greater security to the daily lives of ordinary people.[26] The report cited seven elements: (1) economic security; (2) food security; (3) health security; (4) environmental security;[27] (5) personal security; (6) community security; and (7) political security.[28] The report's drafters believed that inclusivity was more important than specificity; indeed, broad integration was viewed as the concept's major strength.[29]

Conversely described by critics as "opaque," "too broad," and "arbitrary," human security, despite (or because of) its everything-but-the-kitchen-sink inclusiveness, has been an effective "rallying cry" for "a diverse coalition of states, international agencies, and NGOs [non-governmental organizations]" to bring about the international convention on antipersonnel mines and create the International Criminal Court.[30] Whatever its analytical merit, or lack of it, human security is firmly entrenched, if not necessarily in international law, then in the lexicon of international relations. Growing in influence, it is both a spin-off and dynamic partner of globalization.[31]

Globalization has connected persons and organizations, not only to themselves, but also with and concomitantly independent of governments, facilitating collaborative activity and furthering collective interests, a

[26] Paris, "Human Security: Paradigm Shift or Hot Air?," 89.
[27] This related to pollution and resource depletion, not global warming and climate change. Ibid., 90.
[28] Ibid., 89-90.
[29] Ibid., 90.
[30] Ibid., 88, 91, 92, 93, and 102.
[31] Globalization, in this context, is shorthand for a conglomeration of modernizing, and some might say, liberalizing trends, across a broad spectrum of the social, political, and economic spheres, focused ever more directly and concretely on the rights and interests of individuals.

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process now described as transnational (across states) rather than international (between or among states). The concept of human security mirrors this trend, reorienting security from states to persons, and from power and interests, the primary concerns of traditional state-centered security, to rights and protections.[32] Human security has not, however, supplanted national security, despite what may be the ascendance of (or preoccupation with) the transnational over the international. Rather, each of these, human security and national security, serves useful purposes in responding to traditional and novel threats in a more complex, rapidly changing world.[33]

Climate change and other environmental security considerations feature prominently in human security writing. Even those who argue for de-securitization of climate change acknowledge that climate change threatens human security.[34] "Climate change is very likely the biggest challenge the world has ever faced,"[35] one such author has written, which may be true for this particular era of geologic time, now that the threat of nuclear annihilation appears to have passed, but diverting "attention and resources away from what needs to be done [to address climate change] and towards the military … [is] the last thing we need."[36] What we do need, this author concludes, is "a unified approach that involves actors from all levels of politics and society."[37] Sustainable security, a closely related concept, offers that unified approach.

Sustainable Security

Sustainable security might aptly be described as a hybridization of environmental security, human security, and sustainable development.[38] In

[32] Globalization may be both good and bad for human security. Fen O. Hampson, "Human Security," In *Security Studies: An Introduction*, ed. Paul Williams (2008). New York: Routledge, 235-236.

[33] In temporal terms, human security may be seen as more long-term in its aims and perspective, while national security is more near-term focused.

[34] Buckland, "A Climate of War? Stopping the Securitisation of Global Climate Change," 1. Buckland asserts: "That environmental change can contribute to enormous problems for human security is something that those on both sides of the [securitization] debate do not disagree on." Ibid., 4-5.

[35] Ibid., 13.

[36] Ibid.

[37] Ibid.

[38] Sanjeev Khagram, William C. Clark, and Dana F. Raad, "From the Environment and Human Security to Sustainable Security and Development," *Journal of Human Development* (2003) 4 (2).

present form it blends notions of national security, collective security, and human security into a preventative approach to short- and long-term threats, especially transnational threats now challenging our ever more globalized, interdependent international system.[39] Recognizing the symbiosis of security and development, wherein the lack of one contributes to a degradation of the other, sustainable security espouses a rebalancing of diplomacy, development, and defense, to address underlying causes of instability and insecurity.[40]

Citing a 2007 Center for Naval Analyses (CNA) report entitled "National Security and the Threat of Climate Change,"[41] the Center for American Progress, a chief proponent of sustainable security, labels climate change a root cause of instability and insecurity, calling it "a threat multiplier in some of the most volatile regions of the world."[42] Sustainable security advocates, like the advocate for de-securitization noted above, perceive an imbalance between the resources devoted to defense and those allocated to development, and the recent preference for military approaches to diplomatic ones.[43] The key, these advocates would submit, is finding the right synergy among the "3Ds" of defense, diplomacy, and development, so

[39] Gayle E. Smith, "In Search of Sustainable Security: Linking National Security, Human Security, and Collective Security to Protect America and Our World," (June 2008, 3–5) http://www. americanprogress.org/issues/2008.06/sustainablesecurity.html (accessed February 19, 2009).

[40] Center for American Progress. "Sustainable Security 101: Why We Need a New Security Paradigm," (August 2009) http://www.americanprogress.org/issues/2009/08/sustainable_security_ 101.html (accessed October 27, 2009); Gayle E. Smith, David Sullivan, and Andre Sweet. "The Price of Prevention: Getting Ahead of Global Crises." November 2008, http://www. americanprogress.org/issues/2008/11/price_of_prevention.html (accessed February 19, 2009). This article makes seven recommendations: (1) fully integrate prevention into the national strategies that guide foreign policy formulation and implementation; (2) build an integrated, interagency mechanism for long-range strategic planning that is tied directly to the allocation of resources; (3) organize the government to support prevention and ensure coherence across the executive branch; (4) invest intelligence, diplomatic, and economic resources in the most vulnerable areas and regions; (5) reengage with the international community, and improve and then support international treaties and norms; (6) develop new tools and capabilities for crisis management; and (7) address the resource and staff shortages of civilian agencies, particularly the State Department and the United States Agency for International Development. These overlap, somewhat, and otherwise harmonize nicely with the Center for Naval Analyses' five recommendations.

[41] See discussion, infra.

[42] Smith, "In Search of Sustainable Security." 12.

[43] Center for American Progress, "Sustainable Security 101: Why We Need a New Security Paradigm."

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as to create and maintain conditions of security essential to stability while mitigations and adaptations are found and implemented for the "huge environmental challenges" that climate change will pose.[44]

Another way to look at sustainable security is that it refocuses the military instrument of national power from war making to peace building.[45] This does not mean that the military should not be expert in winning battles; rather it means that the military (and not solely by itself) must be capable of winning battles and securing peace. Winning the peace in climate change conflicts to come, or which may yet be avoided, requires that the 3Ds—each and all of them—be geared toward effective mitigation and timely adaptation.[46]

Having seen that climate change is a growing concern to human security and sustainable security theorists, we next consider the cause and effects of climate change.

Global Warming and Climate Change

As Thomas Friedman recently put it, the world may have entered an "Energy-Climate Era," an era in which "global warming, global flattening, and global crowding" are converging.[47] Adverse climate change, already underway, will continue, and probably worsen. The prevailing view is that the major cause of climate change is anthropogenic global warming, resulting from emission of "greenhouse gases" into the atmosphere. If so, reducing greenhouse gases is imperative.[48]

That remains beyond the international community's grasp, however, as COP 15 starkly revealed. As *The Economist* put it in its December 2009 special report "Stopping Climate Change," "It," climate change, "is all about

[44] Oxford Research Group. *The Sustainable Security Webpage.* http://sustainablesecurity.org/ issues/climatechange (accessed October 27, 2009).
[45] See, for example, Brown et al., "Climate Change as the 'New' Security Threat: Implications for Africa," 1150.
[46] Ibid., 1154.
[47] Thomas L. Friedman, *Hot, Flat, and Crowde,*(New York, 2008) Farrar, Strauss and Giroux, 26.
[48] Bryan Walsh, "How to Win the War on Global Warming," *Time Magazine Online*, April 16, 2008 http://www.time.com/specials/2007/printout/0,28804,1730759_1731383_1731363,00.html (accessed November 25, 2008).

politics. Climate change is the hardest political problem the world has *ever* had to deal with (emphasis added)."[49]

Global warming and climate change remain hotly debated and deeply politicized.[50] The IPCC's Fourth Assessment, which concluded that man-made global warming is "unequivocal,"[51] that the air, oceans, and land are warming with "likely" to "virtually certain" impacts on ecosystems, water resources, human health, industry, settlement, and society,[52] has not quelled the global warming controversy, but climate change is now generally accepted to be a product of global warming, despite lingering uncertainty as to where, when, and how much.[53] The effects of climate change will likely vary from region-to-region, but will last for centuries, perhaps millennia, even if strong measures are quickly taken.[54] Ironically, near-term changes in several regions may be beneficial but dangerously short-lived.[55]

Climate change is already causing significant impacts in the United States and around the world.[56] Present and predicted climate change effects include more frequent and severe weather-related natural disasters, intensifying heat waves, wider and quickening desertification, longer-lasting and deeper drought, more unpredictable and damaging floods, wider-ranging and more destructive wildfires, habitat-altering ocean acidification, irreversible sea level rise, and, accelerating biodiversity loss.[57] The number

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[49] "Getting warmer," *The Economist* Special Report "Stopping Climate Change," (December 5, 2009) 4.

[50] Seth Borenstein, "AP IMPACT: Statisticians Reject Global Cooling," (October 26, 2009) linked from *The ABC News Home Page* at "Technology & Science," http://abcnews.go.com/Technology/wireStory?id=8917909 (accessed October 29, 2009).

[51] Pachauri et al., eds., *Climate Change 2007: Synthesis Report, Summary for Policy Makers*, 2.

[52] Ibid., 3–7.

[53] Ibid., 2 and 13.

[54] National Oceanic and Atmospheric Administration. "New Study Shows Climate Change Largely Irreversible."
http://www.noaanews.noaa.gov/stories2009/20090126_climate.html (accessed January 26, 2009).

[55] For example, some imagine that a warmer Siberia could become the world's new breadbasket, whereas others fear that the release of methane, now trapped in permafrost, would be devastating.

[56] See, for example, Katie Howell, "Eroding Alaskan Coastline Threatens Wildlife Habitat, Cultural Resources, Oil and Gas Development," *Environment and Energy Daily Online*, (February 26, 2009) http://www.eenews.net/ll (accessed March 2, 2009).

[57] Global warming-related climate change is not the only environmental condition of concern. Inextricably linked are interrelated environmental impacts (degradation) associated with population growth, natural resource depletion, anthropogenic pollution, and pandemic disease, among other phenomena, all of which pose significant

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of persons affected by weather-related natural disaster tripled in the last decade.[58]

These phenomena, combined with exploding population growth, could lead to large-scale displacements of peoples, especially unsustainable rural-to-urban migration. Competition may ensue over scarce or valuable commodities.[59] Some states will fail; others may aggressively exploit dwindling resources. Both routes could lead to conflict.[60] The fusion of such events, with inevitable and somewhat unpredictable second- and third-order effects, could induce wide-ranging geopolitical upheaval, threatening states, regions, and perhaps even the international system.[61] Indeed, it is more likely that the consequential effects on governments, economies, and societies, rather than climatological alteration itself, will most likely cause or intensify conflict.[62]

Whatever the causes, the world's climates are changing, and while it is important that science continue to find and understand the complex and less well understood mechanisms of causation, we must not lose focus on the apparent, foreseeable, and compelling security effects. We will now look at those effects and how governments and others conceptualize them.

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environmental security risks in their own right. While each and all of these are important, global warming related climate change appears to be the most threatening, by far. That said, the response to climate change should not proceed in isolation. Environmental remediation and environmental security abjure piecemeal solutions.

[58] Jerome C. Glenn and Theodore J. Gordon, *2007 State of the Future,* (2007) Washington, DC: World Federation of the United Nations Associations and American Council for the United Nations University, 2.

[59] Arctic resource competition is a prime example.

[60] One should not presume a straight line progression. Brown et al,. "Climate Change as the 'New' Security Threat: Implications for Africa," 1148.

[61] Henrik Urdal. "Demographic Aspects of Climate Change, Environmental Degradation and Armed Conflict," (January 16, 2008) http://www.un.org/esa/population/meetings/EGM_PopDist/P18_Urdal.pdf (accessed November 19, 2008).

[62] Nils P. Gleditsch, "Environmental Change, Security, and Conflict," In *Leashing the Dogs of War: Conflict Management in A Divided World*, eds. C. Crocker et al. (2007) Washington, DC: U.S. Institute of Peace Press, 177-195, http://hei.unige.ch/sections/sp/courses/0607/gleditsch/readings/Gleditsch-ENVIRONMENTAL-CHANGE-SECURITY-AND-CONFLICT.pdf (accessed December 30, 2009). Gleditsch cogently points out that "(f)ew, if any conflicts justify single-issue labels like 'environmental conflict" or 'ethnic conflict.' We can always relate conflict to several issue dimensions …" Ibid., 188.

The Destabilizing Effects of Climate Change

Climate change is a multi-faceted threat, and a "profound strategic challenge."[63] The 2007 CNA report, pointing to IPCC, National Oceanic and Atmospheric Administration, and National Aeronautical and Space Administration analyses, concludes that climate change will seriously affect America's national security, will make volatile regions of the world more unstable, and will increase tensions even in stable regions.[64] CNA thus recommends that the U.S. incorporate climate change fully into U.S. strategy, play a greater role in mitigating global warming, build partnerships that help less developed nations adapt to climate change, enhance the operational capability of the Department of Defense (DOD) through more energy-efficient combat power, and assess climate change impact over the next 30–40 years on DOD installations worldwide.[65]

Food and water shortages, health crises, population displacement, resource and territorial conflict, damage to infrastructure, and greater poverty are likely to erode confidence in governments that are too weak or too poor to ameliorate these conditions.[66] The infertile, inhospitable conditions created by climate change may prove fertile and hospitable to extremist ideology, inviting to transnational crime, and insuperable to impoverished, weakened, and disenfranchised inhabitants.[67] In a climate of fear, resentment, and panic, governments weak and strong, alone and together, will struggle to maintain order, deliver humanitarian relief, and create economic opportunity.[68]

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[63] Andrew J. Bacevich, *The Limits of Power,* (New York: Metropolitan Books, 2008) 178; John M. Broder, "Climate Change Seen as Threat to U.S. Security," *The New York Times*, August 9, 2009, http://www.nytimes.com/2009/08/09/science/earth/09climate.html (accessed August 9, 2009).

[64] Center for Naval Analyses, *National Security and the Threat of Climate Change*, (Alexandria, VA: The CNA Corporation, 2007) 6-7.

[65] Ibid.

[66] Ibid., 13-16.

[67] Center for Strategic and International Studies and Center for a New American Security, "The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change," (November 2007) http://www.cnas.org/node/126 (accessed February 19, 2009). k Mix

[68] Thomas F. Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases," (1994) http://www.library.utoronto.ca/pcs/evidence/evid3.htm (accessed December 30, 2009). Homer-Dixon argues that fragmentation and authoritarianism, both of which are conflict-aggravating factors in their own right, are likely by-products of chronic internal conflict related to environmental stress. Another salient consideration is that the deleterious effects of climate change on economic, social, and political

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Climate change, as a growing number now recognize, is as significant to national security as to human security.[69] True, climate change has not yet caused, and may not cause, major war,[70] but low-level regional conflict is foreseeable, collaterally, if not directly.[71] In the United States, military strategy and doctrine are evolving, with new emphasis on climate change. In early 2009, Director of National Intelligence, Dennis Blair, in his first Annual Threat Assessment, revived the term "environmental security," saying:

> Climate change, energy, global health, and environmental security … [are] critical issues … in a future where global warming and resource shortages will have destabilizing effects on many regions, threatening the vital interests of the United States.[72]

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conditions and status may induce adversely affected peoples to "engage in violence as an alternative livelihood strategy," a factor frequently observed in radical Islamist terrorism. See Jon Barnett, and W. Neil Adger, "Climate Change, Human Security And Violent Conflict," *Political Geography* (2007) 26(6): 651, http://waterwiki.net/images/7/77/Climate_change%2C_human_security_and_violent_conflict.pdf (accessed January 3, 2010). Climate change may not be a sufficient cause of armed conflict, but probably will be a root cause.

[69] The International Federation of Red Cross and Red Crescent Societies, in its *World Disasters Report 2009*, states: "The threat of disaster resulting from climate change is twofold. First, individual extreme events will devastate vulnerable communities in their path. If population growth is factored in, many more people may be at significant risk. Together, these events add up to potentially the most significant threat to human progress that the world has seen. Second, climate change will compound the already complex problems of poor countries, and could contribute to a downward development spiral for millions of people, even greater than has already been experienced." Anne Moorhead. 2009. "Climate Change—Early Warning." In *World Disasters Report 2009*. Geneva, Switzerland: International Federation of Red Cross and Red Crescent Societies, http://www.ifrc.org/publicat/wdr2009/summaries.asp (accessed October 25, 2009).

[70] Ken Conca, and Geoffrey Dabelko, eds., *Environmental Peacemaking,* (Washington, DC: Woodrow Wilson Center Press and Baltimore and London: The Johns Hopkins University Press, 2005, 5).

[71] National Intelligence Council, "Global Trends 2025: A Transformed World," (November 2008) http://www.dni.gov/nic/NIC_2025_project.html (accessed April 19, 2009), 66-68, NIC 2008-003.

[72] InsideEPA. "Intelligence Chief Revives Environmental Security as High Priority," *Defense Environment Alert* 14, no. 4 (February 17, 2009); Dennis C. Blair. "Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence," (February 12, 2009) http://intelligence.senate.gov/090212/blair.pdf (accessed February 19, 2009).

The 2008 National Defense Strategy conceives of climate change as cause for uncertainty in the strategic environment.[73] U.S. Joint Forces Command's "Joint Operating Environment 2008" identifies a number of serious climate change-related threats,[74] and under the heading "Properly Balanced Global Strategic Risk," the Chairman of the Joint Chiefs of Staff, in his *CJCS Guidance for 2009–2010*, states:

> Climate change and environmental degradation increase … tensions, putting pressure on vulnerable populations while changing our operating space, in the Arctic and elsewhere. We do not yet understand the military implications of the changing global environment, and must examine them closely to be ready.[75]

DOD Undersecretary of Defense for Policy, Michèle Flournoy, cites climate change as one of five key strategic trends. It is, she suggests, an "accelerant" of state failure, humanitarian crises, and other conflict-producing tensions.[76] Similarly, the American Security Project (ASP), an organization whose directors are primarily current and former national-level politicians and high-ranking military officers, describes climate change as one of four "grave challenges."[77]

Within the Armed Services, the U.S. Navy has formed Task Force Climate Change to, among other things, examine the security implications of a continuously navigable Arctic region.[78] The new Army Field Manual

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[73] Robert M. Gates, *National Defense Strategy June 2008,* (Washington, DC: U.S. Department of Defense, 2008) 4-5, http://www.defenselink.mil/news/2008%20national%20defense%20strategy.pdf (accessed February 19, 2009).

[74] The Boston Globe, "New US Military Report on Global Warming Raises Worry," (December, 6, 2008) http://www.cnas.org/node/604 (accessed February 19, 2009).

[75] Chairman of the Joint Chiefs of Staff, *CJCS Guidance for 2009–2010* (December 21, 2009), http://www.jcs.mil/content/files/2009-12/122109083003_CJCS_Guidance_for_2009-2010.pdf (accessed January 6, 2010).

[76] Michèle Flournoy, "Rebalancing the Force: Major Issues for QDR 2010," (April 29, 2009) http://www.csis.org/media/csis/events/090501_flournoy.pdf (accessed May 3, 2009).

[77] American Security Project, "A New American Arsenal," (May 1, 2008) 4, http://americansecurityproject.org/issues/reports/new_american_arsensal (accessed April 30, 2009).

[78] The main purposes of Task Force Climate Change, chartered by the Vice Chief of Naval Operations on October 30, 2009, are to "identify Navy action regarding climate change," with a "near-term focus" on the Arctic. Rear Admiral David Titley, U.S. Navy,

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posits that climate change will exacerbate already difficult conditions in many developing countries, triggering massive humanitarian crises.[79] By one prediction, 50 million environmental refugees will exist in 2010, and 200 million or more by 2050.[80] Dr. Geoffrey Dabelko, of the Woodrow Wilson Center for Scholars, using Darfur, in long-troubled, refugee-plagued Sudan, has illustrated how climate change may likely be an underlying cause of conflict.[81]

Security interest groups, such as the Center for a New American Security, which in July 2008 conducted the war game "Clout and Climate Change: A New Global Agenda for the 21st Century," are striving to find solutions.[82] The same is true in other parts of the American Government:

"Task Force Climate Change," briefing slides, Oceanographer of the Navy/Director Task Force Climate Change, September 29, 2009. The United States, of course, is not the only power interested in the fast pace of change in the Arctic. The Japanese, for instance, as reflected by a recent paper written by retired Rear Admiral Kazumine Akimoto, are very much interested in, and concerned by, the prospect of an ice-free Arctic Ocean. Exploitation of the Arctic Ocean for military and commercial purposes may benefit Japan in both ways, but also make it easier for hostile forces to reach and strike it. Kazumine Akimoto, "Power Games in the Arctic Ocean" (2009). The paper is available, in Japanese only, on the Ocean Policy Research Foundation website: http://www.sof.or.jp/en/index.php. An English language version should soon be available on the Institute of the North website: http://www.institutenorth.org. Mead Treadwell, e-mail message to author, October 30, 2009. And see Editorial, "Arctic Heating Up," (October 4, 2009), *The Japan Times Home Page*, http://search.japantimes.co.jp/print/ed20091004al.html (accessed October 29, 2009). That the Arctic ice cap is melting faster than the IPCC predicted in 2007 will no doubt fuel additional ambitions and fears. See Lauren Morello. "Ice, snow melting at accelerated pace—report." *Environment & Energy News*, (December 14, 2009) http://www.eenews.net/gw/2009/12/14/ (accessed December 30, 2009).

[79] U.S. Department of the Army, *Army Field Manual 3-0,* Washington, DC: U.S. Department of the Army, (February 27, 2008) 1–3.

[80] Jerome C. Glenn and Theodore J. Gordon, *2007 State of the Future,* Washington, DC: World Federation of the United Nations Associations and American Council for the United Nations University, (2007) 8.

[81] Geoffrey Dabelko, "Climate Change and National Security," (April 29, 2009) ftp://ftp.jhuapl.edu/nsadrethink/042909/Dabelkobrief.pdf (accessed May 7, 2009). While the situation in Darfur, specifically, and Sudan, generally, is about far more than climate change, a June 2007 United Nations Environment Programme report accords with the notion that climate change effects are material factors. Brown et al., "Climate Change as the 'New' Security Threat: Implications for Africa," 1143.

[82] Center for a New American Security, "War Game: Clout and Climate Change," http://www.cnas.org/node/149 (accessed February 19, 2009). The National Defense University conducted a similar exercise in December 2008. Broder, "Climate Change Seen as Threat to U.S. Security."

Congress, the State Department (DOS), and others.[83] DOS, for example, now has an Environmental Security Working Group in its Bureau of Oceans, International Environmental and Scientific Affairs.[84] The U.S. Agency for International Development is likewise seeking opportunities with DOD to bring so-called "hard" and "soft" power solutions to bear.[85] ASP, espousing elevation of the economic and diplomatic instruments of national power over the military, recommends expanding sustainable development and environmental stewardship; new capabilities to deal with climate change, especially "climate refugees;" and, better environmental conflict resolution mechanisms.[86]

The Ministry of Defence of the United Kingdom (MOD) has a detailed climate change strategy.[87] About the strategy, a substrategy of the Sustainable Development Strategy, MOD states:

> The Ministry of Defence (MOD) Climate Change Strategy has been written to provide the single source of strategic direction necessary to enable the MOD to both *mitigate* and *adapt* to the challenges of climate change and where possible to exploit any opportunities presented by a changing climate (emphasis added).[88]

MOD sees "dangers and uncertainties" as to how nations and peoples will react to climate change—"potentially the greatest challenge to global

[83] Stew Magnuson, "Climate Change Fears Spill Over to the Defense Community," *National Defense Magazine*, (August 1, 2008) http://www.cnas.org/node/312 (accessed February 19, 2009).
[84] See *The Department of State Home Page,* http://www.state.gov/g/oes/climate/index.htm (accessed January 25, 2009).
[85] Henrietta H. Fore, "Aligning 'Soft' and 'Hard' Power," *Parameters* (2008)38 (2): 14-24.
[86] American Security Project, "A New American Arsenal," 11.
[87] Ministry of Defence, United Kingdom. *Climate Change Strategy,* (London: Ministry of Defence, UK, December 2008) http://www.mod.uk/NR/rdonlyres/73ED201B-CC03-41B4-8936-6BED49469D6E/0/ClimateChangeStrategy2009.pdf (accessed October 25, 2009).
[88] *The Ministry of Defence Home Page*, http://www.mod.uk/DefenceInternet/AboutDefence/ CorporatePublications/HealthandSafetyPublications/SSDCD/SustainableDevelopment Policy/ ClimateChangeStrategy.htm (accessed October 25, 2009).

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stability and security," for which it must plan and prepare, focusing on preserving peace and stability in "the regions most at risk."[89]

Along the same lines, the European Union (EU) was slated to adopt a new climate change strategy at a summit to be held in December 2009.[90] Other new additions to the European Security Strategy include energy security, cyber-crime, and piracy (i.e., other leading transnational threats).[91] Of particular concern to the EU are the impacts that climate change may have on trade routes, maritime zones, and previously inaccessible resources, for example, in the Arctic.[92]

The North Atlantic Treaty Organization (NATO) is expected to take a similar tack.[93] Despite uncertainty as to "what is actually changing because of climate change," NATO's Secretary General Anders Rasmussen has said, NATO should start preparing now.[94] The security response to climate change, Rasmussen believes, is not necessarily an exclusively military one; rather, the military is "one tool in what will have to be a big toolbox."[95]

A deeper consensus is emerging that climate change has urgent security implications, for which a concerted, multidimensional, international effort is required.[96] What will be required in the year 2050, however, and how it may be accomplished, and by whom, may be very different than would be the case today. The international landscape in the year 2050 may be a more globalized, more modern but less Western, multipolar, "post-American" world.[97]

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[89] Ibid.; The Olive Consultancy, "UK National Security Strategy—Climate Change an Urgent Priority," *The Olive Consultancy Home Page*, http://consultolive.com/index.php?option=com_content&task=view&id=189&Itemid=65 (accessed October 15, 2009).

[90] Valentina Pop, "Energy and Climate Change Shape EU Security Strategy," *The euobserver Home Page*, http://euobserver.com/9/27275?print=1 (accessed October 15, 2009).

[91] Ibid.; The Olive Consultancy, supra.

[92] Ibid.

[93] Jennifer Glasse, "Climate Change Brings Security Risks, Says NATO Chief," *The VOA News Home Page*, http://www.voanews.com/english/2009-10-01-voa55.cfm?renderforprint=1 (accessed October 15, 2009).

[94] Ibid.

[95] Ibid.

[96] Bryan Walsh, "Does Global Warming Compromise National Security," *Time Magazine Online*, (April 16, 2008) http://www.time.com/time/specials/2007/article/0,28804,1730759_1731383_1731632,00.html (accessed November 25, 2008).

[97] Fareed Zakaria, *The Post-American World,* (New York: W.W. Norton & Co., 2008) 43. In what he described as a "Third Turning," Shawn Brimley, a Fellow at the Center

If climate change poses real, pressing strategic challenges, the question becomes what to do. We will now consider whether the military instrument of national power is an answer.

Transnational Threats and the Response to Strategic Challenges

The idea that the environment has security implications is not new.[98] Environmental security, including the issue of greenhouse gas emissions, was, to varying degrees, part of the national security strategies of Presidents Bill Clinton and George W. Bush.[99] Also not new is the idea that U.S. combatant commanders are thinking about how to use the military instrument of power to address environmental threats at the theater level.[100]

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for a New American Security, forecasts that the international system will be "almost unrecognizable by 2025." Also: "Along with the rise of new great powers such as China and India, the future is likely to see increased conflict driven by climate change, resource scarcity, and continued proliferation of nuclear technology. This geopolitical turn is not complete nor is it fully understood, but that it has begun is undeniable. The core undertaking for the Obama Administration will be to address the challenges of today while preparing the United States to adapt to a world in which power is more diffuse and the sources of danger more distributed." Shawn Brimley. "Crafting Strategy in an Age of Transition." *Parameters* 38, no.4 (Winter 2009–09): 31. And see Colin S. Gray, *After Iraq: The Search for a Sustainable National Security Strateg,* (2009). Carlisle Barracks, PA: U.S. Army War College Strategic Studies Institute, 14-16, http://www.strategic studies institute.army.mil (accessed March 17, 2009). Dr. Gray, who sees climate change as a "leading threat," argues that the U.S. should maintain hegemony. Ibid., 16 and 59-60.

[98] See, for example, Joe D. Manous, Jr., *Environmental Security: A Strategy for the Mitigation of Regional Instabilities?,* Strategy Research Project (2003). Carlisle Barracks, PA: U.S. Army War College, and Norman Myers. "Environmental Security: What's New and Different?," (April 7, 2003) http://www.envirosecurity.org/conference/working/newanddifferent.pdf (accessed May 3, 2009).

[99] Manous, *Environmental Security,* 2.

[100] Ibid., 18. U.S. Southern Command, for example, hosted a two-day environmental security conference in September 2007. Participants included representatives of the Argentinean, Brazilian, Chilean, and Dominican militaries, along with representatives of EPA, USAID, and the U.S. Geological Survey, as well as Florida International University, the University of Miami, the American Council on Renewable Energy, and Science Applications International Corporation. *The U.S. Southern Command Home Page,* http://www.southcom.mil/AppsSC/files/ 0UI0I1190120383.pdf (accessed May 22, 2009).

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What is new is that climate change, it is now better understood, poses security threats unmatched by other environmental phenomena.[101]

The life-sustaining capacity of our planet may be in jeopardy, many now believe.[102] Fears are growing that climate change, that which is already occurring, and the even more dire consequences that may lie ahead will generate instability and disorder, nationally, regionally, and internationally, producing armed conflict.[103] The most violent conflict is foreseen in and near areas that become uninhabitable, for example, due to desertification or sea-level rise.[104] The nature, uncertainty underlying, growing prevalence, and possible intractability of climate change exacerbate its tensions, risks, and threats.[105]

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[101] Environmental security (or climate security) is on the United Nations Security Council agenda, too. Glenn and Gordon, *2007 State of the Future,* 8.

[102] "Unchecked climate change is poised to have wide-ranging and potentially disastrous effects over time on human welfare, sensitive ecosystems, and international security." Pataki, *Confronting Climate Change*, 3.

[103] "The pace of change in the Arctic due to global climate conditions demands that greater attention be focused on the region, its needs and the issues surrounding its development over the near and intermediate term. The implications for U.S. citizens in the region and important U.S. security, economic, environmental, and political interests as a result of changes in the Arctic are profound." Kenneth S. Yalowitz et al., *The Arctic Climate Change and Security Policy Conference: Final Report and Findings,* (Hanover, New Hampshire: Carnegie Endowment for International Peace, 2008) 1. As the flurry of attention now being paid to the Arctic highlights, adverse consequences of climate change are not the only concern. Whatever the effects may be elsewhere of an ice-free Arctic Ocean, a continuously navigable high seas corridor at the top of the world, a highway of global transit and gateway to resource exploitation and competition by Russia, Norway, Denmark, Canada, the U.S., and possibly others, is likewise of "profound" geopolitical significance. Michael Werz, "Climate Change and Geopolitics," (October 2008) *The German Marshall Fund of the United States Homepage*, http://www.gmfus.org/publications/article.cfm?id=497 (accessed October 25, 2009).

[104] Sub-Saharan African, of which the long-suffering Darfur region of Sudan already is an example, is a place where conflict is and will be fueled appreciably by environmentally unsustainable conditions. It is possible, and may be likely, that worsening conditions in and around Sudan will further destabilize its already marginal state structure, with ever greater adverse effect on U.S. interests and security. Worsening environmental conditions should not be considered to be the only source of conflict, however. Some suspect that the well publicized undersea land-grab now occurring in the Arctic, spurred by the prospect of year-round surface navigation, could lead to conflict. On the subject of its Arctic territorial rights Russia has sounded pugnacious, if not belligerent, and even Canada has been aggressive in asserting its interests.

[105] Bacevich, *The Limits of Power*, 180.

In Western liberal democracy, sophisticated states assess their interests, set policies conducive to those interests, and craft strategies to attain policy objectives. States begin with the end in mind, and then find ways and means to accomplish those ends. Strategy in this context is of two types, an overarching grand strategy covering all instruments of national power, and military strategy. The dimensions of climate change are such that both types of strategy are needed.[106]

At present, the international community views climate change largely in terms of its humanitarian consequences. The broader strategic implications are not yet understood, and in some cases, perhaps, are not yet accepted (or acceptable). States must appraise and address the full strategic implications of climate change—political, economic, and military—and not merely react to its humanitarian consequences, as impactful as those may be, in their own right and on the military's strategic depth, that is, its ability to also conduct combat operations.[107] This should encompass mitigation of global warming and adaptation to climate change, both of which will contribute directly and materially to crisis avoidance.[108]

Environment-sensitive strategy must be followed by doctrine and resources usable by a force balanced, and rebalanced, as needed, to operate effectively and efficiently across the spectrum of conflict and through all phases of operations. Foreseeable climate change-related effects and collateral consequences must become an essential part of operational planning for all militaries, as by law it now is in the United States.[109]

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[106] Kelly Hearn, "Washington Times Exclusive: U.S. Military Worries about Climate Change," *Washington Times* (November 13, 2008) http://www.cnas.org/node/535 (accessed February 19, 2009). Even before climate change came to the fore, environmental issues were deemed worthy of incorporation into the National Security Strategy. Elizabeth M. Damonte, *National Security Strategy: What about the Environment?* Strategy Research Project, (Carlisle Barracks, PA: U.S. Army War College, March 15, 2006).

[107] Broder, "Climate Change Seen as Threat to U.S. Security."

[108] "Climate policy should … include coastal protection at home and support for military-to-military environmental security conferences overseas. In addition, the United States should support policies that simultaneously address multiple problems, such as those that reduce security risks but also provide economic benefits—investments in infrastructure, for example." Joshua W. Busby, *Climate Change and National Security: An Agenda for Action,* New York: Council on Foreign Relations, 26, Council Special Report 32; Broder, "Climate Change Seen as Threat to U.S. Security," (2007)

[109] The Fiscal Year 2008 National Defense Authorization Act, Public Law 110–181, section 951, amends 10 U.S. Code §118 to require that the next national security strategy and national defense strategy include guidance for military planners on the risks of climate change, and that the next quadrennial defense review examine capabilities the armed forces will need to respond to climate change.

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Armed forces, whether by default or design, will have an important and enduring role to play in stabilizing (restabilizing) states and regions that may radically and precipitously become destabilized through climate-related changes. We will now inquire as to how that may be best accomplished.

Sustainable Security and Adaptation to Climate Change

The challenge of climate change in the 21st century is a four-sided conundrum. Poverty, population growth, ineffective civil government, and environmental crises are the four main elements that combine to produce instability and conflict. It is where this quartet of calamities can be found that the military instrument of national power is needed most.[110]

More than any other component of the U.S. Government, the military is the most capable and the most durable, possessing the furthest reach and the greatest resources to create and sustain conditions favorable to peace and stability. But in most cases what is needed for mitigating and adapting to climate change, and its destabilizing effects, is less kinetic than peripatetic.[111]

Sustainable security is the appropriate paradigm.[112] It is well suited to this new century of intensifying globalization (good and bad), and the accelerating political, economic, institutional, and environmental changes and challenges that lie ahead. It reflects keenly the reality of the times: military forces must be as adept at making friends as they are at killing enemies.[113]

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[110] Rymn J. Parsons, *Taking Up the Security Challenge of Climate Change,* Carlisle Barracks, PA: U.S. Army War College Strategic Studies Institute (2009) 6.

[111] "In all areas of climate change policy, adaptation and mitigation (reducing greenhouse gas emissions) should be viewed as complements rather than competing alternatives—and the national security dimension is no exception. Some policies will be targeted at adaptation, most notably risk-reduction and preparedness policies at home and abroad. This could spare the United States the need to mobilize its military later to rescue people and to prevent regional disorder—and would ensure a more effective response if such mobilization was nonetheless necessary." Busby, *Climate Change and National Security: An Agenda for Action*, 2.

[112] Environmental security, climate security, and environmental peacemaking, as the concept has variously been called, is "post-Westphalian," focusing on transnational linkages related to "ecosystemic interdependencies." Conca and Dabelko, *Environmental Peacemaking*, 10.

[113] A recently seen bumper sticker: "We're making enemies faster than we can kill them."

http://www.psocommons.org/rhcpp/vol1/iss1/art6
DOI: 10.2202/1944-4079.1023

Due to the size of the task, joint, international, multinational, and multilateral effort is required. Moreover, environment-related activity conducted military-to-military will lessen tensions and enhance relations, by boosting confidence and building trust.[114] Armed forces, within a whole-of-government approach, must become skilled at mixing the 3Ds.[115] This includes, but by no means should be limited to, humanitarian disaster relief.[116]

Adapting to and mitigating the effects of climate change will require a hybrid of sustainable security and sustainable development, linked by grand strategy and military strategy.[117] Climate change effects will strike at the heart of political, economic, and military institutions, by imposing heavy human, economic, and environmental costs on all societies, especially fragile ones already in crisis for those and other reasons.[118] Africa, especially sub-Saharan Africa, may be the best case in point.[119]

Overall, long-term success depends as much on mitigating the causes of climate change as adapting to its effects. We now look at the prominent part that military forces can play in the mitigation arena.

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[114] H. Allen Irish, "A 'Peace Corps with Guns': Can the Military be a Tool of Development?" In *The Interagency and Counterinsurgency Warfare: Aligning and Integrating Military and Civilian Roles in Stability, Security, Transition, and Reconstruction Operations*, eds. Joseph R. Cerami and Jay W. Boggs. Carlisle Barracks, PA: U.S. Army War College Strategic Studies Institute (2008) http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=828 (accessed May 3, 2009).

[115] Irish, "A 'Peace Corps with Guns'," 67-70.

[116] Reuben E. Brigety, II, "Aid for the Future," (July 31, 2008) http://www.americanprogressaction. org/issues/2008/brigety_testimony.html (accessed April 27, 2009).

[117] Brimley, "Crafting Strategy," 36. ("(R)obust development, economic, and military assistance missions will be a critical element of a grand strategy designed to sustain the twenty-first century international system.").

[118] Regional approaches are best, in that they are more tangible than global approaches and more efficacious than local approaches. Conca and Dabelko, *Environmental Peacemaking*, 13-16.

[119] Irish, "A 'Peace Corps with Guns'," 73-74. A 2008 working paper, "Assessment of Select Climate Change Impacts on U.S. National Security," lists these African states as "most vulnerable" to sea level rise, temperature increases, and water scarcity: Egypt, South Africa, Morocco, Tunisia, Sudan, Côte d'Ivoire, Mozambique, Nigeria, Zimbabwe, Ethiopia, Somalia, and Algeria. Marc A. Levy et al. 2008. *Assessment of Select Climate Change Impacts on U.S. National Security.* New York: Center for International Earth Science Information Network, iii, Working Paper. See also Brown et al. "Climate Change as the 'New' Security Threat: Implications for Africa." 1145-1146.

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Mitigation of Global Warming by DOD

In a globalized world almost all problems cross borders, and environmental issues have long been recognized as among the most transnational of all.[120] Climate change is affecting polar regions, sea coasts, and vast interior spaces; it extends to all points of the compass. It can be found in the developed world and in the developing world.

Mitigating global warming is perhaps the most efficacious way to slow or lessen (but not likely stop or reverse) climate change.[121] The international community, especially including the United States and China, should therefore expeditiously set and implement meaningful long-term emission reductions for greenhouse gases.[122] To accomplish this, the developed world must assist the developing world, in both technology and money.[123]

The U.S. military, a very large emitter of greenhouse gases in its own right, can play two very significant roles. First, DOD should demonstrate resolve and leadership by taking action to reduce greenhouse gas emissions, and prepare itself, doctrinally and in technology and infrastructure, to adapt to climate change-related constraints on how it will operate and where it will be based. Second, the United States should conduct military-to-military activities and operations with foreign militaries to help them reduce greenhouse gas emissions and, even more importantly, to promote stability and security directly, through military operations, and indirectly, through climate change-related development assistance.

The military, America's single largest consumer of petroleum, should lead the way, for America and the world, in reducing its carbon footprint, that is, its consumption (combustion) of fossil fuels.[124] No better

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[120] Zakaria, *The Post-American World,* 31.

[121] Pachauri, *Climate Change 2007,* 14 and 18-19.

[122] Blair, "Annual Threat Assessment," 43. The financial burden that the developed world must bear has been contentious throughout the life of the Kyoto Protocol, and was again in Copenhagen in December 2009.

[123] Pataki, *Confronting Climate Change*, 7.

[124] Executive Order 13423, entitled "Strengthening Federal Environmental, Energy, and Transportation Management," requires all federal agencies to be leaders in energy efficiency and other measures, the effect of which would be to reduce greenhouse gas emissions and otherwise lessen global warming. George W. Bush. 2007. *Executive Order 13423.* Washington, DC: The White House, http://edocket.access.gpo.gov/2007/pdf/07-374.pdf (accessed February 19, 2009). The operational impact of making DOD a leader in climate change must be carefully considered. The second- and third-order effects of resource constraints and legal restraints should not be ignored.

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example of America's commitment to ameliorating climate change could be set. Many initiatives are now underway toward that end, under the leadership of the DOD's Director of Operational Energy Plans and Programs, the Strategic Environmental Research and Development Program.[125] The U.S. Navy has announced its intention to reduce by 50% its consumption of fossil fuels no later than 2010.[126]

A second, even more important, direct, and concrete consequence of reducing DOD's carbon footprint is that a cut in America's dependence on foreign oil, resulting from greater energy efficiency and development of alternative fuels and energy sources, will lessen the human, financial, political, and other costs of oil-related, that is, resource-driven, conflict.[127] The more money spent on mitigating and adapting to climate change, the less must be spent, in dollars and lives, on oil and arms, as fewer energy-driven conflicts will arise.[128] The resulting reduction in tensions over the scarcity of this resource will contribute greatly to stability and security.[129]

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[125] 10 U.S. Code §§ 139b, 2901, 2914, 2916, 2917, 2918, 2922, 2922b, 2922c, 2922d, 2922e, 2922f.

[126] Steve Liewer. "Navy Plans Massive Cuts in Fossil Fuel Use." *San Diego Tribune*, (October 22, 2009).

[127] Bryan Walsh. "Does Global Warming Compromise National Security?," *Time Magazine Online,* (April 16, 2008) http://www.time.com/time/specials/2007/article/0,28804,1730759_1731383_1731632,00.html (accessed February 19, 2009); Pew Charitable Trusts, "Climate Change Poses Critical Risks for National Security," infra.

[128] Walsh, "Does Global Warming Compromise National Security?,"; Pataki, *Confronting Climate Change*, 37.

[129] In September 2009, the National Defense University Institute for National Strategic Studies hosted a two-day meeting on DOD energy security. "Energy security is increasingly being recognized as 'the heart' of international security." Courtney St. John, "Institute for National Strategic Studies (INSS), National Defense University Energy Security Conference," issue paper for Task Force Climate Change, Undated. Also in September, The White House Office of Energy and Climate Change Policy along with DOD, CNA, and others conducted a "National Security, Energy and Climate Forum: Challenges and Solutions for the Future." Pew Charitable Trusts, "Climate Change Poses Critical Risks for National Security," *The YubaNet.com Home Page*, http://yubanet.com/usa/Climate-Change-Poses-Critical-Risks-for-National-Security.php (accessed October 15, 2009) ("Climate change is one of a number of trends DoD is looking at as part of the strategic context for this Quadrennial Defense Review," said Kathleen Hicks, Deputy Undersecretary of Defense for Strategy, Plans and Forces. "Climate change can have critical implications for U.S. national security and for the role and use of U.S. military forces, including by serving as a threat multiplier, exacerbating tensions and potentially leading to migration or conflict within or between states over scarce resources. At the same time, climate change also provides opportunities for the

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In Washington in November 2009, at the third in a series of conferences entitled "Climate Change & Security at Copenhagen," hosted by the Institute for Environmental Security, The Brookings Institution, CNA, and others, the Institute's Military Advisory Council issued a "First Statement" calling on the UNFCCC Copenhagen conference to recognize the security implications of climate change and, preventatively, to act decisively on greenhouse gas limitations.[130] The Council further exhorted all governments to integrate the security implications of climate change into military strategy and to reduce their militaries' carbon footprints.[131] One might argue that the Council's recommendations are proof positive of the securitization of an environmental issue or, inversely, of the environmentalization of a security issue, but whether they are one or the other, or neither, they add to the realization that climate change is bigger and coming harder and faster than was reasonably foreseen by the IPCC in 2007. As the nature and effects of climate change have come into sharper focus, so have its geopolitical ramifications.[132]

Conclusion

Worldwide interest in the security implications of climate change has grown exponentially in the last two years. Climate change, whatever its cause(s), is not only real, it has leapt into the vanguard of transnational security concerns, grabbing the attention of those interested in human security and national security alike. It has arrived center stage, taking a spot in the top tier of the international security agenda, and it is not going away anytime soon.

United States and U.S. armed forces to enhance their cooperation with regional and international organizations.").

[130] Institute for Environmental Security, "First Statement of the Military Advisory Committee," http://www.envirosecurity.org/news/MACStatement.pdf (accessed November 3, 2009). CNA also hosted a "Climate Change, State Resilience & Global Security Conference" on November 4, 2009. See http://www.cna.org/news/releasees/091104.aspx (accessed January 3, 2010). The conference focused on humanitarian relief and climate change and security in Latin America and China.

[131] Ibid.

[132] Not surprisingly, the Institute for Environmental Security is not the only entity that hoped to influence the Copenhagen conference on this score. See Nick Mabey, "Climate Change and International Security," (June 2009) http://www.e3g.org/images/uploads/E3G_Climate_Security_Green_Week_June_2009.pdf (accessed October 19, 2009).

Whether climate change has been securitized, however, is harder to say. Domestic legislatures, like the U.S. Congress, and international bodies, like the United Nations, are very much on the minds (and are targets) of the increasingly large and diverse constituency that sees urgency and possible peril in climate change. Still, the security implications of climate change remain subordinate in emphasis, and probably importance, to its direct environmental and human impacts, neither of which, for the moment, seem to have much traction with the American public.

From a security perspective, too much and too little can be made of the human and geopolitical implications and environmental, political, and economic consequences of climate change. Overall thus far, it has been too little, but that is changing. Climate change is receiving greater attention from human security, sustainable security, and national security adherents and practitioners, and not merely in the context of natural disaster relief. Regrettably, however, as was the case with the development of environmental law generally, major new treaties, laws, regulations, policies, and strategies for mitigating and adapting to climate change and its security dimensions must await further, more dire crises than those heretofore attributed to global warming.

Climate change may open new sea lanes of communication and natural resources to exploitation at the top of the world, and submerge island nations beneath rising seas. It may open vast new areas to agriculture, while turning others to desert. And all this, and more, may come sooner and faster than the pace at which unprepared populations can react. Mass migration on a planet with ten billion people means something entirely different than mass migration during the last ice age. Density increases the likelihood of violent collision. In that event, and to preclude that event, all of the instruments of national power must be wielded skillfully.

Military forces have important roles to play: in mitigating global warming, e.g., by reducing consumption of fossil fuels; in adapting to climate change, e.g., by engaging in military-to-military confidence- and peace-building initiatives tailored to environmental and geostrategic conditions; and, in creating and maintaining conditions of security and stability essential for sustainable development, e.g., by combined, joint, inter-agency, multi-national, and multi-lateral action. Climate change is not reason for another conventional arms race, but use of force (i.e., defense) is part of the 3Ds mix. This point is missed by some critics of securitization, presumably due to a misapprehension of the role that military forces could play, especially in crisis avoidance and stability operations.

Based on what we know of and can reasonably predict about climate change, and what we can foresee in security risks and threats, climate change

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is as important to states as to persons, and likely will remain so for the rest of this century, if not longer. The securitization of climate change is necessary, timely, and irreversible, and likely only one major environmental catastrophe away.

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