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The Environment as a National Security Issue

In 1994 a young journalist with a sharp eye for social anxieties and a flair for dramatic prose wrote an article that described environmental change as "the national security issue of the early 21st century."[1] Robert Kaplan's thesis in "The Coming Anarchy" is fetchingly simple: combine weak political systems, burgeoning urban populations, grinding poverty, and a flood of cheap weapons, and society becomes highly volatile. This lethal mixture, Kaplan suggests, already is generating high levels of violence in West Africa; soon it will affect the rest of the planet. This will happen because at the root of social collapse in West Africa is environmental degradation—a problem the entire world is experiencing. The pathways to chaos may differ from one place to the next, but all of humankind is being pushed along them. The state of the environment, Kaplan concludes, has become a matter of national security.

In Washington and elsewhere, security specialists proved receptive to the thrust of Kaplan's argument. As an expression of threat and vulnerability, the Cold War had lost much, if not all, of its real world resonance by the mid-1990s. Meanwhile scientific evidence of the unprecedented magnitude of human-generated pollution, ecosystem simplification, and resource depletion was compelling. And more than three decades of environmental activism had raised the level of consciousness throughout society, giving concern about the environment legitimacy in every sphere of human activity. In this context, defense specialists began asking questions.

- Could environmental change, as it fed back into social systems in the form of disease and scarcity, trigger violent conflict or otherwise produce threats that would be relevant to the security community?

JOURNAL OF POLICY HISTORY, Vol. 12, No. 1, 2000.
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https://doi.org/10.1353/jph.2000.0007 Published online by Cambridge University Press

- Could the environment become a *cause célèbre* for terrorists, or a medium through which terror might be spread?
- Should the arguments of chaos theorists—that complex nonlinear dynamic systems, such as the global environment, are prone to sudden collapse—be used to plot worse-case scenarios for national security planning?
- At the very least, was it plausible that the world would witness a steady increase in instability and tension resulting from differential access to fresh water and fisheries, from logging and other large-scale industrial activities and from pollution and scarcity driving large numbers of people into cities or across borders in search of a better standard of living?

Astute defense specialists had long been alerted to the possible security implications of environmental change through the pioneering work of thinkers such as William Ophuls, Lester Brown, Richard Ullman, and Jessica Tuchman Mathews.[2] Their arguments reinforced and expanded upon concerns about access to natural resources, as expressed in 1952 in the Paley Commission Report to President Truman, *Resources for the Future*. Up through the 1970s, several initiatives had been undertaken under the auspices of national security to protect access to scarce resources abroad. Now, faced with the argument that the end of the Cold War should enable drastic cuts in defense spending, the importance of identifying the principal threats and vulnerabilities of the post-Cold War era took on a special urgency. Perhaps environmental change could—and should—help fill this bill.

Many important relationships between nature and security had long been acknowledged by security specialists: the differences in the modalities of power of land- and sea-based states; the advantages and disadvantages conferred on offense and defense by topography and climate; the challenge of getting fuel and food to troops on foreign soil; and the risks to soldiers posed by unfamiliar viruses and bacteria. Perhaps addressing challenges posed by new forms of environmental stress and scarcity was the logical next phase of a well-established defense tradition. A significant number of people within the national security community—including researchers, policymakers, and high-level officials—began to take this idea seriously, and act upon it.[3]

Thinking about nature and security, however, was by no means confined to the defense establishment. In the 1980s and 1990s a variety of perspectives sought to shape public perceptions, attract resources, and guide policy.[4] At the dawn of the twenty-first century, it is fair to claim that concerns about the magnitude and multiple implications of human-generated environmental change have had significant influence on the theory and practice of *national* security. But it must also be noted that this linkage is itself part of a larger debate on the linkages between environment and security, a debate that has many formulations and that has yet to be resolved. And this in turn

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is but part of an even larger set of discussions about how best to describe, evaluate and manage the complex relationships that exist among ecological and social systems worldwide.

This article explores current ideas and practices related to identifying the environment as a national security issue, from their emergence in the 1970s and 1980s up to the end of the twentieth century. It is organized into three parts: (1) historical background; (2) policy statements and activities; and (3) activities outside the United States.

Historical Background

The roots of contemporary environmentalism are embedded deep in the annals of recorded history. As far back as antiquity, Plato bemoaned immoderate land development, and Gaia, goddess of Earth, was an important member of the Greek pantheon of deities. At roughly the same time, Taoism, Hinduism, and Buddhism defined ways of living that stressed a deep and even unconditional respect for nature and its mysteries.[5] But it was in the Industrial Age, in early modernity, that concerns about the impact of human behavior on the environment similar to those expressed today became popular through writings such as George Perkins Marsh's landmark 1864 study, *Man and Nature.*

According to the environmental historian John McCormick, a number of factors combined to give birth to the nineteenth-century environmental movement, including: a widespread interest in natural history, especially in Britain and parts of Western Europe; growing concern about cruelty to animals; reaching the end of the American frontier, and hence learning that the "second Eden" might not last forever; intrusions by developers into cherished hunting and fishing territories, especially in New England; and a strong desire in the middle and upper classes, fed by Romantic poetry, Impressionist art, and Thoreavian philosophy, to have country retreats from the heavily polluted cities in which they worked[6]. Nineteenth-century environmentalists, divided between preservationists committed to saving wilderness and conservationists articulating an early form of sustainable development, founded exclusive hunting and fishing clubs that purchased land in order to protect it in perpetuity; conceptualized and oversaw the early stages of the national park system, which began in the United States and soon spread to New Zealand, Canada, Australia, and elsewhere; and organized at the global level to share scientific data and discuss issues such as commercial threats to whales and migratory birds.

Two world wars and a depression pushed arguments about protecting wilderness off the American agenda in the first half of the twentieth cen-

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tury. While environmentalists such as John Muir, Henry David Thoreau, Ralph Waldo Emerson, and Theodore Roosevelt were regarded as central figures in American culture and history, peace and prosperity served as the guiding principles of domestic and foreign policy during these turbulent decades.

But environmental concerns returned with great vigor in the 1960s. McCormick points to several factors that together promoted the success of this renaissance.[7] The proliferation of nuclear weapons, the continuation of wartime levels of military spending, and the rapid pace of economic development raised general concerns about the character of advanced industrial society. Scientific evidence began to record and explain the magnitude and variety of human-generated environmental change with great—and disquieting—precision. Environmental accidents, such as oil spills, increased in number and captured public attention. In North America and Europe, baby boomers entered a period of intense social critique and activism that engendered, among others, civil rights movements, women's movements, antiwar movements, and back-to-nature movements. Rachel Carson wrote *Silent Spring* in 1962, an impassioned account of the human recklessness evident in gratifying immediate needs by spraying the planet with poisonous pesticides such as DDT, which gave birth to a new form of social criticism.

Concern about the environment gathered critical mass throughout the 1960s and led to the first Earth Day (1970), the creation of environmental nongovernmental organizations (ENGOs) such as Greenpeace and Friends of Earth, and the renewal of the International Union for the Conservation of Nature (founded in 1909, but largely dormant until the 1960s). The U.S. government responded with the establishment of the Environmental Protection Agency (which became a model for countries around the world) and legislation aimed at protecting water and air quality. In the global arena, a major United Nations conference was held in Stockholm in 1972 that placed environmental problems squarely on the global agenda and created the United Nations Environment Programme (UNEP) to facilitate research, information flows, and policy coordination.

In the early 1970s, the United States and several other countries appeared to be building the infrastructure, gathering the data, and acquiring the expertise that might enable them to develop and implement adequate solutions to problems of environmental pollution, scarcity, and modification. From this foundation, the environmental movement has grown rapidly over the past thirty years, spawning a complex network of regulations, institutions, and advocacy groups; inspiring extensive research and technology development; and shaping policy at every level from municipal and county to regional and global. It has developed two key concepts—sustainable development and environmental justice—that, while still being debated, are widely

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endorsed in one form or another and increasingly used to guide and evaluate both private- and public-sector activity.

Throughout much of this period, however, environmental concerns seemed of little relevance to national security analysis and planning. Defense institutions were generally regarded as an intractable part of the problem. From an environmentalist perspective, they were irresponsible entities that dumped waste on land or at sea, secretly tested nuclear weapons, exposing humankind to radioactive contamination, and were willing to destroy nature when preparing for or engaged in war. But they had to be tolerated in an anarchic world dominated by superpower rivalry and ever vulnerable to the threat of all-out nuclear armageddon.

Nonetheless, evidence of the harmful effects of using defoliants in Southeast Asia during the Vietnam War did lead to two important international agreements: the Additional Protocol I to the 1949 Geneva Convention on the Protection of Victims of International Armed Conflicts (1977) and the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (1977). Also, the "limits to growth" thesis propounded by Meadows et al. and the first OPEC oil crisis in 1973 stimulated some fear about how resource scarcity might endanger economic growth in the North and create competitive conditions ripe for armed conflict.[8] The Carter Doctrine, affirming the strategic value of the oil-rich Middle East, was in part a response to these concerns. But discussions of energy self-sufficiency garnered little support. After all, through trade, arms, and ingenuity one could gain access to anything as long as the real threat to the United States was held in check: the threat of Soviet expansion.

But while the structure and character of the Cold War shaped security thinking in much of the Western world, the elaboration of broader concepts of security did gain some attention. The environmentalist Lester Brown wrote a widely read exploratory piece entitled "Redefining National Security" in 1977. In 1982 the Independent Commission on Disarmament and Security Issues, chaired by the Swedish socialist Olaf Palme, released a report entitled "Common Security." The authors of this report distinguished between collective security (the sort of security against armed force provided to its members by the NATO alliance) and common security, which focused on nonmilitary threats such as those posed by environmental degradation and poverty. This conceptual trajectory was pushed further in Richard Ullman's 1983 article "Redefining Security," in which he sought to broaden the concept of national security to include nonmilitary threats to a state's range of policy options or the quality of life of its citizens. In the mid-1980s, former Soviet President Mikhail Gorbachev expressed a similar perspective through his notion of "comprehensive security."

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In 1986 the Chernobyl nuclear facility experienced a meltdown that caused widespread harm and even wider spread anxiety. Arguments about environmental threats to human welfare and security seemed suddenly very persuasive. The following year, 1987, the World Commission on Environment and Development, mandated by the United Nations and chaired by former Norwegian Prime Minister Gro Harlem Brundtland, issued its report: *Our Common Future*. Focusing on the interlocking processes of population growth, food production, ecosystem protection, energy use, industrialization, and urbanization, the authors argued for a global commitment to sustainable development.[9] To fail to make this commitment, they contended, would place the future of much, perhaps all, of humankind in jeopardy.

By the late 1980s, as the Cold War approached absolute zero and environmental awareness rose to unprecedented levels, and as some of the more threatening implications of rapid technological change were being worked out by researchers, articles began to appear making explicit linkages between environmental change and security. Influential writings by Jessica Mathews, Norman Myers, and others began to be widely circulated in policy circles.[10] Arguments varied enormously, but the basic idea that environmental change was serious enough to be considered a security issue made sense to many analysts, activists, and practitioners.

Policy Statements and Activities[11]

Perhaps in response to the articles on rethinking national security published at the end of the Cold War, former President George Bush added threats posed by environmental change to the *National Security Strategy of the United States* in 1991. The following year the Clinton administration was installed in Washington. Vice President Al Gore, supported by individuals such as Senator Timothy Wirth,[12] took seriously the claim that the health of the environment was a matter of utmost importance to the long-term interests of the United States and the world. Often working behind the scenes and in a context of stiff resistance from other senior White House officials, Gore used a variety of strategies to introduce environmental concerns into key agencies and policy areas.[13] So successful was Gore in rallying support in the foreign policy arena that in 1996 Secretary of State Warren Christopher, an individual who until then had seemed scarcely aware of environmental problems, made a corner-turning speech at Stanford University that caught the attention of both environmentalists and foreign policymakers around the world.[14] According to Christopher: "The environment has a profound impact on our national interests in two ways: First, environmental forces

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transcend borders and oceans to threaten directly the health, prosperity and jobs of American citizens. Second, addressing natural resource issues is frequently critical to achieving political and economic stability, and to pursuing our strategic goals around the world."

Indeed, "Environmental initiatives can be important, low-cost, high-impact tools in promoting our national security interests." What sort of environmental initiatives? In his speech, Christopher outlined an ambitious four-part program for his Department:

- Produce an annual report to assess global environmental trends and identify American priorities, beginning in 1997
- Establish a dozen Environmental Opportunity Hubs to involve American embassies in assessing and addressing regional environmental issues worldwide
- Host an international conference on treaty compliance and enforcement within two years
- Promote an array of partnerships with business, and bilateral, regional and global initiatives to channel environmental problems into the social settings that have the resources and will to solve them.

Unfortunately, within a few years budget constraints and other obstacles had erased everything from the State Department's far-reaching and even visionary agenda except for the Environmental Opportunity Hubs.[15] Twelve now exist, although their mandates remain unclear and their resources scant. A core of individuals, including Tim Wirth, until his departure to head the new United Nations Foundation in 1998, and Melinda Kimble, worked diligently to maintain a high profile for the environment within the State Department. Internal opposition, deeply ingrained and hard-to-change behavioral patterns, lack of congressional support, and the inability of anyone to articulate a clear set of foreign environmental policy goals help explain the mixed results of these efforts.[16]

Problems within the State Department, however, did not put the brakes on efforts to integrate environmental concerns and national security. In July 1996, John Deutch, then director of the Central Intelligence Agency (CIA), discussed the relationship between intelligence and the environment in a speech to the World Affairs Council. According to Deutch, the potential for using CIA capabilities and archives to provide useful environmental intelligence at a low cost is great.[17] Another promise of support was outlined in a speech given in August 1996 at the National Defense University by Deputy Under Secretary of Defense for Environmental Security, Sherri Goodman. In line with then Secretary of Defense William Perry's concept of "preventive defense," Goodman signaled her office's desire " to understand where

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and under what circumstances environmental degradation and scarcity may contribute to instability and conflict, and to address those conditions early enough to make a difference," and "to determine where military environmental cooperation can contribute significantly to building democracy, trust and understanding."

The flurry of policy statements in 1996 capped several years of diverse and relentless efforts to integrate environmental concerns into national security policy. Attention focused primarily on ways in which environmental change could threaten national interests and hence become relevant to the traditional mandates of military and intelligence institutions. But environmentalists and security specialists also considered ways in which security institutions and practices can and do affect the environment adversely, as well as ways in which security assets could be applied to restore the environment and—perhaps the greatest area of innovation—support domestic and foreign environmental policy.

A sense of this process can be gained by a brief consideration of the institutionalization of environmental security in the Department of Defense (DOD). In 1973, DOD Directive 5100.50, "Protection and Enhancement of Environmental Quality," was issued. In 1984, Congress created the "Defense Environmental Restoration Account" to fund the clean up of contaminated sites. As these and other activities make clear, throughout the 1970s and 1980s the focus within DOD was on protecting troops, disposing of waste, and cleaning up hazardous materials. But in the 1990s the mandate began to broaden significantly. In response to concerns expressed by President Clinton and Vice President Gore, DOD created the Office of the Deputy Under Secretary of Defense for Environmental Security in 1993. The mandate of this Office included a larger menu of concerns: land restoration, base cleanup, compliance with regulations, and resource conservation measures.[18] Under Secretary Goodman and her Principal Assistant Gary Vest have been aggressive in widening the activities of their office even further to encompass fully the problem of environmental threats to national security. In the latter half of the 1990s, both individuals were prominent around the world in a wide range of venues. As a result, the more comprehensive concept of environmental security gained attention, legitimacy, and substance at home and abroad.

The Intensification of Conventional Environmental Security Issues

During this busy decade, three sorts of environmental threats to national interests were envisioned. Conceptually, these are not new, but the vast magnitude and rapid pace of human-generated environmental change (that is, pollution, depletion, and ecosystem simplification) have, many analysts con-

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tend, given them an unprecedented urgency and destructive potential.[19]

- Tension, instability, conflict and violence that affect U.S. interests and/or the interests of its allies and are caused, amplified, or triggered by environmental problems.

According to researchers such as Peter Gleick and Thomas Homer-Dixon, the potential for environmentally escalated violence is significant and growing. Gleick has written extensively on the possibility of "water wars."[20] Throughout the world, the demand for fresh water is increasing due to population growth and economic development. Many states rely heavily on sources that serve other countries as well. Pollution, depletion, and natural limits affect the availability of water. As demand grows beyond supply, which the United Nations predicts could be the case in fifty-two countries by 2025, tension could grow as well, especially if animosity already exists. This may be especially true in places like the Middle East, where several states compete for the already stressed waters of the Jordan, Nile, Tigris, and Euphrates. While other researchers point out that, historically, states have almost always found ways to cooperate over shared water systems, many acknowledge that acute need may overwhelm regional cooperation in the years ahead, leading to armed violence.[21]

Homer-Dixon has argued that environmental factors could have a far greater impact on intrastate violence. He contends that the prospects for environmentally induced or amplified state institutional failure, ethnic conflict, urban violence, and mass migration are high and likely to increase. Through a series of globe-spanning case studies, his team of researchers paints a foreboding image of a future in which environmental scarcity plays a growing role in generating violent outcomes, especially in developing countries already straining under the burdens of poverty, inefficient and corrupt governments, ethnic hatred, and renegade militaries.[22]

In both of these cases, the U.S. military, alone or in conjunction with other militaries, may be called upon to respond for humanitarian, strategic, or other reasons. Understanding the sources of conflict, developing early warning systems, and having appropriate response strategies in hand could be essential to successful conflict-resolution efforts. At the very least, militaries may be required to create and maintain peace until satisfactory institutional arrangements are in place. With this in mind, both the Department of Defense (DOD) and the CIA are developing early-warning systems. Similarly, an early-warning system is being developed in Canada through the Global Environmental Change and Human Security Project directed by Steve Lonergan.

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- Activities that affect U.S. access to environmental goods abroad.

A common explanation of the Gulf War is that a coalition of advanced industrial states acted to protect their access to oil in the Middle East while waving the banners of state sovereignty and human rights. No doubt there were a number of objectives and rationales shaping the decision to use force, but protecting access to natural resources outside of one's borders is quite credible in this case and likely to remain an important motive in world politics. In many cases, technology can be used to develop substitutes for scarce resources; in other cases, trade will be a more economical approach.[23] But substitution and trade will not always succeed.

In recent years, for example, numerous conflicts have taken place over access to fisheries.[24] It is conceivable that states will one day consider using force to protect environmental goods such as rain forests—which regulate climate, serve as important carbon banks, and contain high levels of biodiversity—if diplomatic solutions prove unsuccessful. While historically these areas have been regarded as under the jurisdiction of the states in which they lie, attempts to underscore their importance to the world community have increased in the past decade. UNESCO, for example, has designated tracts of land throughout the world as Biosphere Reserves or World Heritage sites. In many ways, protecting access to foreign resources is a familiar part of national defense; the question is whether and how it may continue to be relevant.

A related problem concerns crossborder pollution. Typically this has been addressed diplomatically, through bilateral channels and international law. But scenarios are plausible in which force or threats to use force might be used to stop a neighboring country from exporting pollution.

- Terrorist activities that are a response to environmental degradation, that target the U.S. environment, or that use ecological systems (e.g., air or water systems or food webs) as a medium for spreading terror.

One of the great doomsday scenarios that has seized the imagination of the American public is that of a group of terrorists contaminating the water, food, or air supply of one or more major American cities with some dangerous substance such as plutonium or a pathogen like hepatitis, listeria, or a virulent strain of *E. coli*. Recent studies suggest that the country is vulnerable to this sort of attack and unprepared to respond. In April 1998, following the "anthrax scare" in Las Vegas, FBI Director Louis Freeh described chemical and biological terrorism as "the greatest vulnerability we have right now." At the same time, Attorney General Janet Reno stated: "We need to make sure we have a significant stockpile—and I don't think we do—of vaccines and other medications."[25] Numerous researchers have suggested that there

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is a growing risk of a major chemical or biological attack on the United States. Small incidents have already been identified, such as in 1985, when a member of a religious cult contaminated several restaurant salad bars with salmonella, causing 751 people in Oregon to become seriously ill.

In 1995 the White House issued a Fact Sheet claiming that counter-terrorism was a top priority of the Clinton administration and outlining its activities. In the 1999 State of the Union Address, the danger of terrorists using chemical, biological, and nuclear weapons received considerable attention, with promises that new funds would be sought to counter this mounting threat to America's national security.

From a conventional military perspective, chemical and biological weapons are widely regarded as having limited war-fighting utility. While cheap and easy to manufacture, they are difficult to deliver effectively for traditional military purposes. But from the broader perspective of environmental security, they move into a more central position and become more obviously relevant to the military.

Not everyone agrees, however, that the relationships between environmental change and national security proposed above are persuasive. Daniel Deudney, for example, contends that resource scarcity is not likely to trigger conflict because of our tremendous ability to devise substitutes for almost everything we need or acquire things through trade at a lower cost than using force entails.[26] Marc Levy argues that the evidence for a causal relationship between scarcity and conflict is weak.[27] Michel Frédérick regards these arguments as generally well established in the defense community but wonders whether the pervasiveness and urgency that are alleged today are warranted.[28] Still other defense specialists such as C. Boyden Gray and David B. Rivkin Jr. have argued for caution in reorienting security practices around environmental concerns.[29] Ultimately, these authors suggest, the military is a war-fighting machine, and one should be careful not to do anything that might divert its attention or weaken its capacity in this regard.

The Emergence of Non-conventional Environmental Security Issues

In addition to identifying, studying, and devising countermeasures to those threats to U.S. national security that have an important environmental component, four ways of using security assets to advance environmental goals also have received attention. This is quite a novel innovation insofar as the defense community is concerned, and not all of its members are supportive of systematic involvement in "operations other than war." Some have argued, for example, that this trend threatens to undermine the military's ability to remain a finely tuned war-fighting machine.[30] A number of envi-

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ronmentalists have also questioned the value of linking the environment to the defense establishment. Deudney, for example, regards this as a strategic error—militaries are primed to use force, secretive, costly, and cumbersome—not at all well suited to undertake environmental rescue missions.[31] Nonetheless, this is in many ways a promising experiment for environmentalists and security specialists alike.[32]

- Greening the military.

While many environmentalists promote deep structural changes that would tend to render the military obsolete, some are more pragmatic (at least at present), aware that throughout the world militaries are highly trained, well-organized, and well-funded social institutions. Moreover, in a world that regularly produces a vast array of threats—including the threat of armed aggression—militaries are not likely to be dismantled in the near future. In view of this, one must ask about the extent to which they can be made less environmentally destructive than they have been in the past. For in the past militaries throughout the world—and especially in the United States and the former Soviet Union—have been reckless and cavalier, devouring energy, treading carelessly over vast tracts of territory, experimenting with lethal weapons, and generally creating and disposing of huge quantities of toxic chemical and solid waste.[33]

But, according to Kent Butts, in the 1990s the Department of Defense decreased toxic waste by fifty percent.[34] In cooperation with Sweden, it developed guidelines for environmental standards for military training and operations. It worked with Russia and other Arctic nations to reduce radioactive contamination of the Arctic region. The Australia-Canada-U.S. trilateral commission is another example of an attempt to address environmental problems cooperatively. Base cleanup was somewhat less successful, and anecdotal evidence suggests that throughout the world militaries continued to treat the environment in a reckless manner. Nonetheless, environmental awareness appears to have penetrated this historically single-minded and independent entity, and even generated more sustainable forms of behavior. Further research needs to be done, however, to fully assess the ecological modernization process still under way in the defense sector.

- Using military and intelligence assets to support environmental initiatives.

Intelligence and Defense possess highly sophisticated resources that can assist in environmental assessment and monitoring and in developing "green" technologies. This issue received considerable attention in the United States in the 1990s. Under the aegis of Vice President Gore, the CIA permitted

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civilian scientists to examine archived material that might be useful in assessing environmental degradation. The Medea Group, set up by the National Intelligence Council (NIC) in 1992, determined that archived satellite imagery was of great scientific value. Moreover, current intelligence technology is so sophisticated that satellite imagery could be used to diagnose the health of forests as well as monitor deforestation. It can penetrate water well enough to assist in evaluating the condition of fisheries. It already has been used to track and help fight forest fires. In view of this, the NIC began exploring ways to make the CIA's data gathering and analysis capabilities available to environmental consumers, including foreign and nongovernmental organizations. In 1997 the Director of Central Intelligence (DCI) Environmental Center was created partly for this purpose.

Some observers are skeptical of this initiative, on the grounds that the CIA's penchant for secrecy and other responsibilities might corrupt its public offerings.[35] Critics advocate the development of commercial satellite systems. But the technological sophistication of intelligence assets may not be achievable in the private sector for many years, although the private-sector demand for surveillance technologies seems strong. Thus efforts to build bridges between the CIA and a new generation of consumers could remain important for some time. In any case, this initiative is well advanced and unlikely to be stopped. The DCI Environmental Center is mandated to gather and assess environmental data in order to identify trends that might surmount the critical thresholds that would transform them from environmental anomalies and concerns into national security problems. Part of the mandate of this organization is to work toward a wider distribution of its products. Who will choose to take advantage of these, and how cooperative the CIA will really be, remains to be seen.

The U.S. military also possesses extensive resources that might be detailed to environmental policy initiatives, including technology-driving programs, land restoration projects, treaty monitoring, and, possibly, treaty enforcement. Experiments in the 1990s with recycling technologies and ecosystem restoration, by different branches of the U.S. military, may serve as models for future endeavors. Discussions on using the U.S. military (or NATO or UN forces) to monitor compliance with international environmental law remain at a preliminary stage and face stiff opposition.

One of the more fascinating features of these various activities is the notable expansion of interagency communication and cooperation. It seems inevitable that addressing environmental problems will be most successful if the different types of expertise and experience spread throughout the American government are coordinated. Government departments and agencies have a history of being less than forthcoming with each other and of zeal-

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ously trying to protect and expand their jurisdictions and budgets regardless of how resources might be most efficiently deployed. Concern about the environment may be breaking down some of this hostility and distrust. Intelligence agencies have signaled their intention to be more accessible to agencies that never consulted them in the past. The Departments of Energy and Defense, together with the Environmental Protection Agency, signed a Memorandum of Understanding in 1996 stating that they would try to cooperate in this area.[36] Of special importance, through the Environmental Change and Security Project, the Woodrow Wilson Center has hosted regular meetings since 1994 that bring together diverse government officials, scholars, and representatives of ENGOs to discuss different aspects of environmental security.

A suggestive example of this concerns the United States Agency for International Development (USAID). As numerous writers have argued persuasively, population growth and population flows are closely related to environmental problems, as both cause and effect.[37] This is a central hypothesis of Homer-Dixon's research and has figured prominently in discussions about environmental problems since the 1960s. Both the dramatic increase in world population in the twentieth century and the trend toward urbanization are closely linked to environmental degradation, scarcity, and insecurity. Concern for population issues is, in turn, an important element of the activities of USAID. Thus, through its Center for Population, Health and Nutrition (PHN), it has supported environmental security research and policy formulation. For example, it is an important sponsor of, and participant in, both the Environmental Change and Security Project and the Global Environmental Change and Human Security Project discussed elsewhere in this article—projects that regularly have involved the United States and other militaries. Moreover, USAID also has explored environmental security through the Organization for Economic Cooperation and Development, which released a report on this subject in 1999.

• Promoting dialogue, building confidence, and transferring technology. Within American military circles there is much informal talk about the value of face-to-face encounters to relieve tensions, address fears, and improve transparency. In the 1990s, this desire created another promising approach to linking environment and security.

Incomplete and inaccurate information is an important source of misunderstanding, poor policy, and tension. Dialogue can build trust and help identify shared interests. Unfortunately, many international forums are constrained by the perception that advanced industrial states are seeking to control the international environmental agenda, maintain the status quo,

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and shift the heavy work of environmental rescue onto the developing world. Conferences on environmental security have provided a new context for dialogue, surmounting some of the obstacles evident in other venues. These can have collateral benefits insofar as they create greater awareness of the concerns, incentives, and beliefs of other countries. Throughout the 1990s, the United States hosted or participated in conferences and workshops on environmental themes, such as those organized by the Army War College, the Asia-Pacific Center for Security Studies, and NATO.

- Providing disaster and humanitarian assistance.

While all states are vulnerable to the adverse effects of environmental change, the capacity to respond varies enormously. In particular, as Homer-Dixon has argued, states with weak or corrupt governments, economic problems, and/or ethnic tensions may be unable to respond effectively.[38] In these cases, severe environmental change can generate large-scale humanitarian crises. In the 1990s, under the auspices of the United Nations, the international community was called upon to provide unprecedented levels of emergency relief in many parts of the world, such as Cambodia, Haiti, and Somalia. Often, these operations required military assistance, and there are sound reasons for predicting more rather than fewer of these demands in the future. But, as the case of Somalia amply illustrated, various logistical and resourcing problems need to be resolved for international humanitarian intervention to become effective.

It is quite conceivable that in the future the U.S. military will be called upon to assist in environmentally amplified humanitarian disasters. It may find itself involved in helping with water and food distribution, managing populations flows, and combating disease outbreaks. If it is to succeed, it will clearly require more focused training and a more robust mandate than have been the case in the past.

On this issue, it is important to remember that in many smaller countries the military is the only state resource that can be called upon to help implement and monitor statewide policies and assist in managing disasters and other crises. Because these often have an important environmental component, some training in environmental factors—which the United States could provide—may be crucial to success.

Activities Outside the United States

During the 1990s, American scholars and practitioners devoted considerable time to "rethinking national security." Now that the Cold War is over,

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they asked, what threats and vulnerabilities are most urgent? What lies on the horizon? How should defense budgets and forces be restructured to maximize security under conditions of rapid change and high levels of uncertainty? In addressing these questions, much attention was placed on globalization processes, technological innovations, and environmental change. These are complex and interactive networks of variables, and thus are much more difficult to describe and assess than the offensive intentions or capacity of the Soviet Union (themselves quite a challenge). Although this new analysis has identified many valid concerns—such as the proliferation of weapons of mass destruction, computer sabotage, and transnational crime—much remains to be determined. Moreover, accurate assessments of these new and emerging threats are very elusive. We are, in effect, attempting to isolate the dangerous emergent properties of a highly dynamic and complicated world system, a system composed of numerous subsystems (economic, political, religious, cultural, ecological, and so on). The simple blocs of the Cold War have been replaced by the complex networks of the New World Order.

It is therefore not surprising that some analysts are skeptical of bold claims about new security priorities, noting, for example, that the high-pitched fears of militant world Islam expressed in the early 1990s dwindled very quickly—as was certainly appropriate. No doubt the mad rush to redefine security has produced some fads and more than a few red herrings. But given the unique character of some of the forces driving planetary change at this point in history, it is reasonable to assume that some rethinking of security is inevitable and necessary. And hence it is not surprising that other scholars and practitioners are quite prepared to make bold claims.[39] Debates are heated; stakes are high.

The United States, however, is not alone in this undertaking. Other countries are equally concerned about the shifting character of threat and vulnerability, and the new demands of security, at the end of the twentieth century. Several have explored environmental change in this context; others have been very interested in understanding why the United States is so absorbed with this topic. (Should they be worried, for example, about the directions in which U.S. defense policy is evolving?) Given the rapid and transnational character of information flows, it is hard to determine whether the interest in environment and national security crept into Washington from a variety of points and then flooded from there onto the world stage, or instead emerged somewhat spontaneously and with equal vigor in different places. What is certain is that the U.S. commitment to this area is of significance to the rest of the world, and influences policy agendas beyond American borders.

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Whatever the origin, a wide range of environmental security activities can be observed from Norway to China to Australia. Some of these have been undertaken in partnership with the United States. Through the Department of Defense, for example, bilateral agreements for cooperation on environmental security issues were negotiated with Germany, Norway, Sweden, Russia, Poland, the Czech Republic, and Hungary in the 1990s. Trilateral agreements were established with Canada and Australia and, through the Arctic Military Environmental Cooperation initiative, with Russia and Norway.

Numerous other activities were undertaken by NATO, which began holding meetings on environmental issues as early as 1980. During the 1990s, NATO hosted a series of Advanced Research Workshops on environmental themes under its Partnership for Peace Program. It also funded a Pilot Study, "Environment and Security in an International Context," through its Committee on the Challenges to Modern Society. At the other end of the world, several organizations in Australia held meetings to discuss environmental security issues relevant to the Asia-Pacific region.[40]

A huge number of research programs were set up or expanded in the 1990s to study environmental change and national security issues. The activities of these programs are tracked by the Woodrow Wilson Center's Environmental Change and Security Project and published in its annual *Report*. A few are mentioned here to provide a sense of the extent of this research effort.

The Research Panel on Environment and Security of the Canadian Global Change Program has studied several environmental security issues relevant to Canada. Canada has, in fact, been very active in this field. Much of the research on environmental scarcity and violent conflict done in the 1990s was directed by Thomas Homer-Dixon at the University of Toronto through a series of three major projects. The Global Environmental Change and Human Security Project, which adopts a broader, more humanist perspective, was also set up during this period by Steve Lonergan at the University of Victoria. It is part of a much larger research network, the International Human Dimensions of Global Environmental Change Program, headquartered in Bonn, which is itself part of an even larger set of interlocking research networks funded by OECD countries.

In Europe, Ecologic, the Center for International European and Environmental Research, undertook a Pilot Study for NATO on environmental security. The International Peace Research Institute in Oslo, has also been very active. Under the guidance of Nils Petter Gleditsch, it organized major conferences, undertook significant original research, and published a wide range of materials. Also in the 1990s, the World Conservation Union in

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Gland, Switzerland, produced a major study of environmental security that considered ways in which it might be relevant to the development community. Finally, Jyrki Kakonen directed several important environment and security studies at the Tampere Peace Research Center in Finland.[41]

In the developing world, activities were not as well organized during this period and anecdotal evidence suggests that (a) the concept of environmental security was often regarded as a potentially threatening American construct, and (b) the concept of sustainable development tended to seen as a more fruitful lens for analysis and policy. Nonetheless, through the agency of organizations such as the Asia-Pacific Center for Security Studies, North-South dialogue has been frequent and mutually beneficial especially in parts of Asia. Clearly an essential next step—if this approach is deemed worthwhile—is to promote transnational research between North and South, as well as independent research in the latter region.

Conclusion

Insofar as linking environmental change and national security is concerned, it is clear that a wide range of activities were undertaken in the 1990s, many of which built upon work initiated in the 1980s or earlier. What is less clear is how to evaluate this maelstrom of activity.

It is helpful first, perhaps, to place the activity in a larger context. Research, debate, and policy focused on integrating environmental concerns into national security have been a small part of a larger effort to explore linkages between various conceptions of environmental change and national well-being. This in turn is only one perspective being explored as humankind studies and speculates on the complex networks of relationships between ecological and social systems. It is also a rather small part of national security thinking and policy. In both contexts, it is a controversial undertaking, freighted with rhetorical and analytical tension, that has mobilized skepticism and resistance from security specialists and environmentalists alike. The former fear a degradation of national security planning and preparedness; the latter, a degradation of environmental policy and the environmental movement. In short, it is a small piece of a large picture, but a piece that has come into focus quickly, that has attracted billions of dollars in the United States alone, that has garnered attention throughout the world, and that has mobilized many critics as well as supporters.

It is not acceptable to suggest that because this is a small piece of a much larger picture, concerns are unimportant or expectations should be kept low. As chaos theory demonstrates, in complex systems a small change in a critical variable can have enormous consequences for the system as a whole.

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One must ask, then, about both the possible and probable costs and benefits of, as Kent Butts puts it, "using the established U.S. interagency-based national security system, in partnership with other states, international organizations and private industry, to address environmental problems, which the system already recognizes as security threats."[42] Is this approach good for our national security? Is it good for our environment? Is it good for security and the environment outside the United States?

Unfortunately there can be no definitive answer to any of these questions.[43] Every evaluation depends on what values one wishes to maximize. The decision to take seriously unconventional threats and engage in "operations other than war" has probably been beneficial to the defense establishment, insofar as it may have protected it from budget cuts and made it a more valuable tool in a world in which the requirements and possibilities of power are constantly changing. It may be important to the continuing success of the state, which is required to address many problems for which it was not designed. Those who would prefer to see the state and the military dismantled sooner rather than later cannot be encouraged by this development.

The integration of environment and national security is well advanced. Butts is quite accurate in writing about "environmental problems, which the system already recognizes as security threats." Given this, a more interesting question might be: Should this process be constrained, encouraged, redirected, or arrested? The answer to this question needs to be socially constructed through the interactions of diverse individuals and groups that have become involved with the issue as critics or as advocates.

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Notes

1. Robert Kaplan, "The Coming Anarchy," *The Atlantic Monthly* 273 (1994): 61.

2. W. Ophuls, *Ecology and the Politics of Scarcity* (San Francisco, 1976); Lester Brown, "Redefining National Security," *Worldwatch Paper* 14 (1977); Richard Ullman, "Redefining Security," *International Security* 8 (1983): 129–53; and Jessica Mathews, "Redefining Security," *Foreign Affairs* 68 (1989): 162–77.

3. For a discussion of the debate between those seeking to widen the concept of national security and those resisting this, see Bernard I. Finel, "What Is Security? Why the Debate Matters," *National Security Studies Quarterly* 4.4 (1998): 1–18. The Autumn 1998 issue of *National Security Studies Quarterly*, which includes Finel's article, contains several pieces relevant to this debate.

4. For a general discussion, see Richard A. Matthew, "Environment and Security: Concepts and Definitions," *National Security Studies Quarterly* 4:4 (1998): 63–72; idem, "A Clean, Secure Future," *Forum for Applied Research and Public Policy* 13:4 (1998): 115–19; and Daniel

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Deudney and Richard A. Matthew, eds., *Contested Grounds: Security and Conflict in the New Environmental Politics* (Albany, N.Y., 1999).

5. For discussion, see Peter Marshall, *Nature's Web: An Exploration of Ecological Thinking* (London, 1989).

6. John McCormick, *Reclaiming Paradise: The Global Environmental Movement* (Indianapolis, 1989).

7. McCormick, *Reclaiming Paradise*, 1–24.

8. Donella Meadows et al., *The Limits to Growth* (New York, 1972).

9. Sustainable development was then defined in the vague but accommodating terms of meeting "the needs of the present without compromising the ability of future generations to meet their own needs." WCED, *Our Common Future* (Oxford, 1987), 8.

10. Mathews, "Redefining Security"; Jessica Mathews, "Power Shift," *Foreign Affairs* 76 (1997): 50–66; Norman Myers, "Environment and Security," *Foreign Policy* 74 (1989): 23–41; idem, *Ultimate Security: The Environmental Basis of Political Stability* (New York, 1993); and idem, "Population, Environment, and Conflict," *Environmental Conservation* 20 (1993): 205–16.

11. Portions of this section are adapted from Richard A. Matthew, "Rethinking Environmental Security," N. P. Gleditsc, ed., *Conflict and the Environment* (Dordrecht, 1997), 71–90; Matthew, "Environment and Security: Concepts and Definitions"; idem, "A Clean, Secure Future"; and idem, "Security and Scarcity: A Common Pool Resource Perspective," Samuel Barkin and George Shambaugh, eds., *Anarchy and the Environment: The International Relations of Common Pool Resources* (Albany, N.Y., 1999).

12. Wirth later headed Global and Multilateral Affairs in the State Department.

13. Gore proved especially adept at restructuring *in situ* policies and institutions and at using environmental initiatives as a basis for advancing diplomatic goals. The so-called "Gore bilaterals," forged with his counterparts in Russia, South Africa, and elsewhere, are a series of high-level agreements to cooperate on shared environmental problems that are typical of Gore's resourcefulness. For a sense of his perspective on environmental issues, see Al Gore, *Earth in the Balance: Forging a New Common Purpose* (Boston, 1992).

14. This speech is available with a brief commentary in Warren Christopher, *In the Stream of History: Shaping Foreign Policy for a New Era* (Stanford, Calif., 1998).

15. One general overview report, entitled *Environmental Diplomacy*, was published in 1997.

16. For a useful overview of how the U.S. foreign policy process has handled the environment since the 1970s, see Stephen Hopgood, *American Foreign Environmental Policy and the Power of the State* (Oxford, 1998).

17. In fact, as discussed below, several initiatives were well advanced by 1996, although problems associated with concerns about declassification criteria persisted.

18. See the *Report of the Secretary of Defense to President and Congress on Environmental Security*, May 1994.

19. For a debate on the significance of environmental threats, see Deudney and Matthew, *Contested Grounds*.

20. Peter Gleick, "Environment and Security: The Clear Connections," *Bulletin of the Atomic Scientists* 47 (1991): 17–21; idem, Water and Conflict: Fresh Water Resources and International Security," *International Security* 18 (1993); Thomas Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases," *International Security* 19 (1994): 5–40; idem, *Environment, Scarcity, and Conflict* (Princeton, 1999); and Thomas Homer-Dixon and Jessica Blitt, *Ecoviolence: Links Among Environment, Population, and Security* (Lanham, Md., 1998).

21. Aaron Wolf, "International Water Conflicts and Conflict Resolution," ISA Paper (1997).

22. Homer-Dixon's influential research findings serve as a principal source for Kaplan's dramatic speculations on the future.

23. Daniel Deudney, "The Case Against Linking Environmental Degradation and National Security," *Millennium* 19 (1990): 461–76.

24. See Gareth Porter, "Environmental Security as a National Security Issue," *Current*

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History (May 1995).

25. Quotes from U.S. and World News website, http://sddt.com/files/librarywire/98/04/23/1h.html

26. Deudney, "The Case Against Linking Environmental Degradation and National Security."

27. Marc A. Levy, "Is the Environment a National Security Issue?" *International Security* 20 (1995): 35–62.

28. Frederick, "A Realist's Conceptual Definition of Environmental Security."

29. C. Boyden Gray and David B. Rivkin Jr., "A 'No Regrets' Environmental Policy," *Foreign Policy* 83 (1991): 47–65

30. For this critical perspective, see Gray and Rivkin, "A 'No Regrets' Environmental Policy"; and Michel Frédérick, "A Realist's Conceptual Definition of Environmental Security, "Daniel Deudney and Richard Matthew, eds., *Contested Grounds*: 91–108. For a sampling of more general arguments that tend to support this position see Herman Kahn and Julian Simon, eds., *The Resourceful Earth: A Response to Global 2000* (New York, 1984).

31. Deudney, "The Case Against Linking Environmental Degradation and National Security."

32. An editorial in the magazine *World Watch*, for example, reviews the trend of using military assets to deal with unconventional environmental problems and concludes that this is a promising phenomenon: "it may be politically easier to shift spending inside the military [for environmental purposes] than to shift it out. It may be easier to reform military thinking by assuring the generals they're needed than by informing them that the future has left them behind." Ed Ayres, "New Missions for the Military," *World Watch* (1999): 3–4.

33. For a disturbing account of the military's legacy in the former Soviet Union, see Murray Feshbach, *Ecological Disaster: Cleaning Up the Hidden Legacy of the Soviet Regime* (New York, 1995).

34. Kent Butts, "Why the Military Is Good for the Environment," in Jyrki Kakonen, ed., *Green Security or Militarized Environment* (Brookfield, 1994); idem, "National Security, the Environment, and DOD," *Environmental Change and Security Project Report* 2 (1996): 22–27.

35. Ronald Deibert, "Military Monitoring of the Environment," *Environmental Change and Security Project Report* 2 (1996): 28–32.

36. For a comprehensive listing of government and nongovernment activities, see the *Environmental Change and Security Project Reports* published annually since 1995 by the Woodrow Wilson Center in Washington, D.C.

37. See, for example, Paul Ehrlich, *The Population Bomb* (New York, 1968); Paul Ehrlich and Anne Ehrlich, *The Population Explosion* (New York, 1990); Norman Myers, *Ultimate Security*; idem, "Population, Environment and Conflict"; Matthew Connolly and Paul Kennedy, "Must It Be the West Against the Rest?" *The Atlantic Monthly* 274 (1994): 61–83; Homer-Dixon, "Environmental Scarcities and Violent Conflict"; idem, *Environment, Scarcity, and Violence*; and Homer-Dixon and Blitt, *Ecoviolence*.

38. Homer-Dixon, *Environment, Scarcity, and Violence*.

39. A typical example of this is the impassioned debate over Samuel Huntington's "Clash of Civilizations" thesis. See Samuel Huntington, *The Clash of Civilizations? The Debate* (New York, 1993).

40. Alan Dupont, *The Environment and Security in Pacific Asia*, Adelphi Paper 319. (Oxford, 1998).

41. For information purposes, it may be useful to contrast the above with representative U.S.-based activities. These range from research undertaken by the Center for Environmental Security at Pacific Northwest National Laboratory to the community organized Military Toxics Project, located in Maine, which studies and lobbies for base cleanup and pollution prevention. The Consortium for International Earth Science Information Network at Columbia University maintains an excellent database. Also at Columbia University, the Environment and Security Project focuses on scarcity, degradation, and conflict in the developing world. On the West Coast, the Nautilus Institute for Security and Sustainable Development has long

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pioneered research in this area. Finally, an office of the Global Environmental Change and Human Security Project, headquartered in Canada, was established at the end of the 1990s at the University of California at Irvine. It has a special focus on issues relevant to coastal communities.

42. Butts, "National Security, the Environment, and DOD," 22.

43. The author's answer is offered in Matthew, "Rethinking Environmental Security."

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