IN DEFENSE OF ENVIRONMENT AND SECURITY RESEARCH

By Richard A. Matthew

Abstract

Since the end of the Cold War, many policymakers and researchers have been rethinking and pushing the boundaries of the definition of security. Perhaps the most extensive and controversial part of this project has been the numerous and varied attempts to identify links among environmental change, conflict, and security. But concern has recently been raised about whether a decade of environmental security research, debate, and policy experimentation has produced worthwhile results. This article argues that such concern is premature. Environmental security has (a) reinvigorated important elements of security research and policy; (b) made pioneering contributions to understanding the shifting sources of global violence and the changing requirements of security; (c) contributed to a broader debate about the social and political effects of transnational change; and (d) been a conceptual and political boon for the environmental movement. Now is the time to build on these gains instead of abandoning them.

In the past year, U.S. policymakers have made a rapid and dramatic effort to devote sufficient attention and resources to the threat of terrorism.[1] While the attacks of September 11 give a special validity and urgency to this effort, they are not its sole justification. In fact, the current retooling of U.S. security policy fits squarely into the general project of rethinking security that has been pursued by policymakers and researchers since the end of the Cold War. Phenomena such as nuclear proliferation, Islamic fundamentalism, rogue states, failed states, infectious disease, currency meltdowns, global mafias, computer hackers, terrorism, and environmental scarcity have all been identified in the last decade as urgent threats to U.S. national security—threats that need to be taken more seriously. At the same time, many of the analyses and scenarios that have sought to provide empirical and theoretical support to claims about these diverse and unconventional security threats have been criticized as weak and exaggerated.

Perhaps the most extensive and controversial part of this project has been the numerous and varied attempts to identify links among environmental change, conflict, and security. In spite of the enormous enthusiasm that has surrounded this effort, many of today's security pundits are retreating from the strong assertions and commitments made in the late 1990s.[2] This is not simply because terrorism has made a shift in priorities essential, or because the current administration is less concerned about environmental change than its predecessor. It is also—and perhaps most significantly—due to concern about whether a decade of environmental security research, debate, and policy experimentation has produced any worthwhile results. This concern has clear implications for other attempts to rethink security.

The following pages argue that the retreat is premature. Environmental security has reinvigorated important elements of security research and policy that were marginalized or abandoned during the Cold War period. Much of the recent research also has made important and pioneering contributions to understanding the shifting sources of violence and changing requirements of security in an age of unprecedented inequality and interdependence. Work on environmental security thus contributes to a broader—and crucially important—debate about the social and political effects of globalization and other processes of transnational change. Moreover, the environmental security literature has recovered

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connections between environmentalism and peace that were prominent 40 years ago and that continue to be valuable; brought new perspectives and stakeholders into debates on environmental change; underscored the possible security implications of global phenomena such as climate change and biodiversity loss; and boosted the political capital of certain sectors of the environmental movement.

Criticisms of the research and policy efforts of the 1990s have raised many valid points that have enriched the discourse and sharpened the insights of this field. Unfortunately, the field has also been characterized by intense rivalry and remarkable pettiness, both of which have focused undue attention on those imperfections, overstatements, and other weaknesses that are an inevitable but often inconsequential part of any ambitious research and policy undertaking. It is important to assess the general and constructive contributions of this work and not to be misled by efforts to discredit it that rely heavily on distortion and misrepresentation.

Critical Scarcities

The bibliography maintained since 1995 in the Woodrow Wilson International Center for Scholars' *Environmental Change and Security Project Report* makes clear the variety of recent contributions to environment and security studies. These contributions have come from scholars and policymakers throughout the world and include markedly different perspectives, approaches, and claims. Nonetheless, the dominant and most public perceptions of the field have largely been shaped by the work of two widely read and widely cited authors. In 1994, Robert Kaplan

Port au Prince, Haiti, 1994

The first U.S. soldier walks through the gate of the city's seaport: "The insecurities to which environmental stress contributes in places such as Cambodia, Zimbabwe, Pakistan, and Haiti are grounded in patterns of insecurity based on longstanding practices of exclusion and exploitation."

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published an article in *The Atlantic Monthly* arguing that factors such as demographic change, urbanization, environmental degradation, and easy access to arms were combining in West Africa to produce chronic violence, state failures, and a steady flow of miserable people seeking to escape from situations that have become uninhabitable (Kaplan, 1994).[3] Even more alarming, Kaplan argued, this volatile and destructive mixture was gaining critical mass elsewhere in the world. Kaplan suggested that not even the rich states of the industrial North were immune to the growing threat of violent anarchy.

Kaplan's essay had tremendous influence within the first Clinton administration. U.S. Under Secretary of State for Global Affairs Timothy Wirth had a copy sent to every U.S. embassy, and President Clinton and Vice President Gore saw in Kaplan's worldview a concise account of the sort of crisis they had encountered in Somalia and were then struggling to address in Haiti. For months, the Kaplan thesis was enthusiastically discussed at security meetings, taught on Washington, DC campuses, and championed by an array of inside-the-Beltway security specialists. Outside Washington, however, Kaplan's essay stimulated some immediate and remarkably pointed criticism on the grounds that it was culturally insensitive, one-dimensional, analytically impoverished, and unduly alarmist.[4]

In developing his worldview, Kaplan drew heavily on the work of Thomas Homer-Dixon (Homer-Dixon, 1991; 1994; 1999; and Homer-Dixon & Blitt, 1998).[5] The insight that impressed Kaplan is presented very clearly in the concluding chapter of Homer-Dixon's major work on the subject:

> [E]nvironmental scarcity…can contribute to civil violence, including insurgencies and ethnic clashes…[T]he incidence of such violence will probably increase as scarcities of cropland, freshwater, and forests worsen in many parts of the developing world. Scarcity's role in such violence, however, is often obscure and indirect. It interacts with political, economic, and other factors to generate harsh social effects that in turn help to produce violence (Homer-Dixon, 1999, p. 177).

The argument that leads to these conclusions is quite straightforward. Homer-Dixon regards environmental scarcity as the product of an insufficient supply of, an unequal distribution of, or too much demand for a resource that forces some sector of a society into a condition of deprivation. These three sources of scarcity are in turn caused by variables such as population growth, economic development, and pollution. They interact in various ways—for example, declining supply can prompt one group to seize control of a resource, simultaneously forcing another group onto an ecologically marginal landscape. Faced with growing scarcity, societies may experience health problems, social segmentation, and declines in agricultural and economic productivity. People may be compelled to move, often intensifying ethnic and other group-identity tensions in the receiving areas of this migration. Demands on government may increase while tax bases are being eroded. Violence may ensue or, if already present, worsen.

It is in such volatile, interactive, and complicated contexts that environmental scarcity can be described as a cause of conflict. Scarcity is not, Homer-Dixon stresses, likely to be a sufficient or necessary catalyst, but its presence in the causal network that generates violence is evident and growing. Where is this condition found? Homer-Dixon contends that developing countries with small supplies of social and technical ingenuity are most vulnerable to the negative effects of environmental scarcity. He concludes that, unless we find ways to increase their amount of ingenuity—that is, "ideas for new technologies and new and reformed institutions"—we can expect more of this type of violence in the years ahead (Homer-Dixon, 1999, p. 180). Homer-Dixon's reception in Washington was perhaps even warmer than that accorded Kaplan. As his biography indicates, he was invited to the White House twice to brief a very supportive Vice President Gore—two of an enormous number of high-profile presentations he made in the United States and abroad during the 1990s.[6] But like Kaplan, Homer-Dixon's work has also been the subject of a fair amount of criticism on methodological, rhetorical, and analytical grounds.[7]

The enormous attention accorded Kaplan and Homer-Dixon has obscured the range and sophistication of the larger intellectual enterprise to which they contributed——an enterprise that is itself part of an analytical perspective that extends back to antiquity. This attention has not been confined to policy circles or media outlets. For example, a 2001 scholarly volume edited by Nancy Peluso and Michael Watts entitled *Violent Environments* begins with a discussion of Kaplan and Homer-Dixon but also acknowledges that "environmental security is a

complex field" (Peluso & Watts, 2001, p. 12). Within a few pages, however, it is clear that Peluso and Watts are using the claims of Kaplan and Homer-Dixon to represent environmental security as a whole. Thus, they are comfortable abandoning the complexity they themselves acknowledge:

> Typically, the environmental security literature makes efforts to link conflicts and environmental degradation. The latter is understood to mean the overuse of renewable resources, overstrain of the environment's sink capacity (pollution), and impoverishment of the living space. However, [the literature's] exclusion of the most substantial forms of environmental transformation and degradation caused by nonrenewable resource extraction (mining in particular), dam construction, and industrial activity is at once noteworthy and curious (Peluso & Watts, 2001, p. 26).

It is important to point out that while Homer-Dixon's focus on renewable resources is well-known in the field, it is somewhat misleading to claim that focus is typical or representative of environmental security research.[8] Significant and highly visible research has also been conducted on non-renewable resources.[9] Peluso and Watts' simplification of the field has been echoed in the broader literatures on security and international relations, in which the work of Homer-Dixon is commonly used to represent the entire body of environment and security work.

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Homer-Dixon's argument is itself often simplified, further complicating matters. Peluso and Watts illustrate this tendency when they make claims such as the following: "Conditions of resource scarcity do not, contrary to the claims of Homer-Dixon and others, have a monopoly on violence" (Peluso & Watts, 2001, p. 5). But neither Homer-Dixon nor any other environmental security researcher of note has made this claim. On the contrary, Homer-Dixon (and many others) regards environmental scarcity as something that, in combination with other variables, *may* contribute to *some* violent conflicts. The image he evokes is one of conflict resulting from complex interactions among several natural and social variables. It reiterates ideas presented in the Brundtland Report in 1987 as well as in many earlier and later analyses (World Commission on Environment and Development, 1987). Sadly, the narrowing and distorting of the field so that it encompasses little more than the work of Homer-Dixon (followed by a second narrowing and distortion of Homer-Dixon's arguments) is extensive and even commonplace.

At least part of the explanation for all this attention and simplification lies in the fact that several other prominent studies have reiterated the Homer-Dixon thesis, albeit with subtle differences, making this position an obvious target in the field.[10] But prominence does not make an argument representative, and using the scarcity-conflict thesis to discredit environmental and security research is unfortunate for at least four reasons. First, this move breaks the field into constitutive, adversarial, and incommensurable camps that are largely imaginary and that do not begin to capture the richness of environment and security literature. Second, it both contextualizes contemporary environment and security research in a misleading way and severs the rich connections that research has to a two-millennia old body of work. Third, using Homer-Dixon's thesis as the fulcrum point for environment and security diverts attention away from other contemporary arguments (such as those advanced by Peluso and Watts themselves regarding the pervasiveness and destructiveness of certain forms of structural violence) that are generally very compelling and valuable. Fourth, this distortion misses the opportunity to engage in a productive discussion, something that is intrinsic and essential to the dialogic tradition of studying political phenomena. Such a discussion would refine the insights of environmental security research and help bring them into other sectors of international relations research, security studies, and foreign policymaking.

There is no doubt that Homer-Dixon's work has been very influential in Western policy circles, and that it has inspired several weak and inconclusive research efforts such as the NATO study *Environment and Conflict in an International Context* (1999).[11] There is also no doubt that Homer-Dixon's work can be criticized on many grounds.[12] Indeed, it may have been

important in the 1990s to question how both Kaplan's anarchy thesis and a simplified version of Homer-Dixon's scarcity-conflict thesis guided the policy selection and defense priorities or some politicians and policymakers.[13] But rather than suggest that environmental security research can be judged mainly on the basis of these two linked concepts, researchers and policymakers should place them in the much broader context of other environment and security research and debate.

The Roots of Environmental Security

This broader context has an important historical dimension that has received remarkably little attention. In his article "Bringing Nature Back In: Geopolitical Theory From the Greeks to the Global Era," Daniel Deudney provides a brief historical overview of several related strands of environment and security thought. He suggests that insights from earlier eras can supplement contemporary work and yield richer understandings of complex issues such as the potential for economic development and the likelihood of conflict in much of the southern hemisphere (Deudney, 1999).

The concept of geopolitics frequently evokes the early 20th century work of Friedrich Ratzel, Alfred Mahan, Rudolf Kjellen, and Halford Mackinder—writers associated with (a) simple concepts (alleged to be universal) relating military power, security, and geography; (b) the contest between land and sea powers that Thucydides discussed in the fifth century B.C.; and (c) notions of "heartland," "rimland," and "shatterbelt" that would later define the worldviews of strategists like Henry Kissinger. But as Deudney points out, geopolitical thought—the idea that geography and climate have security implications—has a much longer lineage.[14]

Deudney also notes the existence of "a diverse array of claims about the natural environment as a cause of political, economic, and social outcomes" that he describes as *naturalist theories*. (Deudney, 1999, p. 27). Today, insights from the naturalist and geopolitical theories discussed by Deudney are evident in the work of prominent environmental historians such as Alfred Crosby, Jared Diamond, Brian Fagan, John McNeill, and Clive Ponting (Diamond, 1997; Fagan, 1999; McNeill, 2000; & Ponting, 1991). But these insights are frequently ignored in the so-called mainstream environment and security literature; and this ignorance has meant a lack of research and policy focus on how the historical distribution of natural resources (as well as human attempts to control and exploit these resources) have predisposed certain regions of the world to the precise forms of violence and conflict studied by Homer-Dixon and others.[15]

For example, although much has been written about unconstrained population growth, political corruption, institutional failure, and lack of ingenuity in the South, rather less has been said about the highly destructive patterns of colonialism that preceded and perhaps enabled these phenomena. The world's hot zones, from South and Southeast Asia through East and West Africa and the Middle East to Central and South America, are inadequately described and explained by theories that are generally ahistorical. Each of the countries in these regions is also the product of a particularly violent colonial experience that was in large measure shaped by four centuries of Western competition to control the planet's natural resources.

Consider, for example, Paul Collier's excellent statistical analysis of 47 civil armed conflicts that took place from 1965 to 1999. Collier identifies a set of variables that are strongly correlated to violent conflict. These include three economic factors ("dependence upon primary commodity exports, low average income of the country, and slow growth"); ethnic dominance; and diaspora (Collier, 2000, p. 9). Collier argues that the combatants in the civil conflicts singled out by Homer-Dixon, Kaplan, and others "either have the objective of natural resource predation, or are critically dependent upon natural resource predation in order to pursue other objectives" (Collier, 2000, p. 21).

Collier's clever insight suggests that debates over whether resource scarcity or abundance is more likely to be linked to violent conflict (a key split in simplified accounts of environment and security research) may be misleading.[16] In a fundamental way, abundance and scarcity are both naturally and socially constructed conditions, and may at times be two sides of the same coin. That is to say, water is scarce in Saudi Arabia by any measure, while oil, gold, and diamonds are naturally abundant in some parts of the Middle East and Africa. But the latter minerals are irrelevant until a society assigns value to them. Moreover, people living in any of these areas may experience real or relative resource scarcity if they are not able to gain access to resources or otherwise benefit from their existence.

Who might benefit from a given struggle for resource control and access (and whether that struggle is violent or procedural) depends to some extent on

the region's political history and the socio-economic structures that have developed over time. In some parts of the world, the institutional and economic legacies of colonialism might play the lead role in determining whether environmental change contributes to conflict and insecurity. In these cases, desalination plants and reforestation programs may be necessary but insufficient foundations for reducing such threats. Policymakers must also address the perennial political problems of entrenched inequalities, institutional weaknesses, and historical grievances. In many cases, instigators of violence link their political agendas and ambitions for personal gain to a rhetoric of social justice designed to mobilize groups that have been exploited, coerced, ignored, or otherwise poorly treated by the state or by external entities. Often these groups—and the livelihoods they depend upon—are also extremely vulnerable to the insecurities and hardships caused by rapid environmental change.

The practice of dehistoricizing conflict and violence (especially in the South) and of obscuring its structural aspects is evident in simplified renderings of environment and security literature and almost certainly depresses the field's value. It fosters the misleading impression that when poor states cross certain thresholds of resource scarcity, they are likely to succumb to violence or, if violence is already present, that it is likely to escalate—scenarios that suggest an endpoint with the sort of dire imagery popularized by Kaplan, Raspail, and others. This tendency to ignore research that includes historical analysis has generated an underappreciation—particularly in the policy world—of the remarkable capacities of all types of societies to adapt to environmental change. Recovering the antecedents to contemporary environment and security literature, as Deudney has sought to do for over a decade, generates a more complicated but also more plausible analysis.[17] Incorporating this marginalized perspective into mainstream discussions of environmental security reminds us that environmental change, resource scarcity, and resource abundance have been linked to insecurity and violence through social processes of greed and grievance for a very long time; that contemporary conflicts build on and are shaped by histories that might have to be understood in order for the conflict to be resolved; and that societies of all types have usually proven resilient and innovative in the face of environmental change.[18]

Why has so much credibility been given to simplified versions of Homer-Dixon's work and so little attention paid to the historical approaches of people like Deudney, Diamond, and Crosby? First, historical analysis has not been prominent in the field of international relations in the United States, and so ahistorical social science research is not unusual or suspect. Second, naturalistic theories were largely discredited by the modern idea that technology had overcome most natural constraints (as well as by concerns over the extent to which certain nature-based and geopolitical theories had been used by the Nazis during World War II). Third, during the Cold War the fundamentals of conflict appeared directly linked to ideological and other social variables. Environmental change did not seem especially salient to the Cold War rivalry or even to the two world wars that preceded it—an attitude that has persisted among many security analysts.

But people have incorporated environmental variables into security analysis since antiquity, and this practice will not disappear for an obvious reason: it is both sensible and useful. Rather than reject environment and security research on the specious grounds that it makes ridiculously simple causal arguments about scarcity and conflict, researchers and policymakers should step back and look at the ways in which the field is recovering productive historical perspectives. The structural and ideological theories that seemed so enlightening during the 20th century are considerably less interesting today, and efforts to broaden security analysis ought to be encouraged.[19]

The Contributions of Environmental Security

This broader approach to environment and security yields a different and perhaps more compelling account of the ecological dimensions of violent conflict and national and human security. This account has three important dimensions.

The first dimension emphasizes the complex ongoing interplay between natural geography and human history and focuses attention on the environmental underpinnings of those historical patterns of conflict and insecurity that are linked to processes of economic development, colonialism, and state-building.[20] Aaron Bobrow-Strain captures this dimension well when he writes:

> Unlike analysts who speak of "the Chiapas conflict" as a unitary phenomenon, I argue that the "Chiapas conflict" is, in fact, a constellation of temporally and spatially differentiated conflicts. Chiapas is truly a "warscape"—something that

> can only be understood by examining the ways conflict unfolds, changes, and takes multiple forms across time and space (Bobrow-Strain, 2001).

Later, Bobrow-Strain notes "that the focus on environmental scarcity obscures important dynamics that shape the trajectories of violence in Chiapas" (Bobrow-Strain, 2001, p. 157). He situates the 1994 Chiapas conflict in the context of "land invasions" that have shaped political struggle in the region since the 1930s (Bobrow-Strain, 2001). The crucial point is that all conflicts have histories that are in some measure constitutive. The image of conflict being triggered when a community crosses an environmental threshold (an image associated with but somewhat unfair to Homer-Dixon) is simple but unrevealing (Homer-Dixon, 1991).

In his analysis, Collier notes that past conflict and diaspora correlate strongly to present conflict. Again the implication here is that history matters—when we ignore it, our capacity to explain and predict conflict is diminished. The same claim is almost certainly relevant to concerns about security in its national and human formulations. The insecurities to which environmental stress contributes in places such as Cambodia, Zimbabwe, Pakistan, and Haiti are grounded in patterns of insecurity based on longstanding practices of exclusion and exploitation. The British, for example, set up institutions in South Asia and Africa that gave some groups greater access to natural resources such as water and arable land. Independence and a cascade of political reform efforts have not been able to efface these inequalities from the fabric of social and economic life in countries such as Pakistan and India. In fact, this pattern is evident throughout Africa, Asia, Australia, and the Americas. From this perspective, it is clear that new and more virulent forms of environmental degradation wrought through human activities are aggravating practices of violence and insecurity that have long histories.

A second dimension of a broader environment and security perspective focuses on the current conditions that are conducive to conflict and insecurity. The popularized account linked to Homer-Dixon and evident in the NATO and Environment and Conflict Project (ENCOP) studies tends to reiterate very general conditions that one can find in much earlier writings, such as Fairfield Osborn's *Our Plundered Planet*. Writing in 1948, Osborn concludes his overview of environmental insecurity by asking:

> When will it be openly recognized that one of the principal causes of the aggressive attitudes of individual nations and of much of the present discord among groups of nations is traceable to diminishing productive lands and to increasing population pressures (Osborn, 1948, pp. 200-201)?

Osborn's analysis also focused on weak or misguided political institutions and a willingness to use coercion (Osborn, 1948). These factors, in combination with unchecked population growth and unsustainable economic practices, provoked Osborn to predict that "[e]very country, [over] all the world, is met with the threat of an oncoming crisis" (Osborn, 1948, p. 201). That much contemporary environmental security writing reiterates Osborn's argument does not undermine the insights of either generation. Indeed, this set of relationships—concerning above all population growth, environmental degradation, and conflict—has worried analysts for decades. But the field has also been stuck for decades at a high level of generality, making claims that are obvious to every observer.

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Fortunately, more quantitatively oriented studies (such as the ones by Collier, Hauge, and Ellingsen) and the State Failure Task Force's *Phase II Report* have succeeded in adding some specificity to this portion of the literature (Hauge & Ellingsen, 1998; Esty et al., 1998; 1999). Although further quantitative research is required, one can generalize from the existing literature a typical scenario that is highly prone to conflict. This scenario includes: (a) an economy dependent on a lucrative natural resource (gold or oil rather than water or biodiversity) to which access can be controlled; (b) a fractious ethnic cleavage that the dominant group has been unable to resolve; (c) low education and high infant-mortality rates; (d) inadequate dispute-

resolution mechanisms and corrupt governance institutions; (e) a history of violent conflict; and (f) a diaspora community of angry emigrants and refugees forced to leave and willing to back one side in a civil war. Under these conditions, individuals accustomed to the use of force may be motivated by greed, injustice, or scarcity to take up arms. Indeed, conflict may be most likely in those situations in which a range of motivations converge to persuade sufficiently large numbers of people that violence may be justified, profitable, inevitable, or transformative. Environmental stresses will figure in some, but not all, of these motivations, and hence these stresses will be an elusive but often significant element of the causal network that generates conflict and insecurity.

Of course, under such volatile, overdetermined conditions it is difficult to "prove" that environmental change plays a major causal role. But this uncertainty is true of any single conflict-salient variable. The Correlates of War Project sought unsuccessfully for decades to isolate the precise variable or variable mix that caused war. An influential set of essays on the causes of World War I make it very clear that causality is (a) complex, and (b) something that can be approached at many different analytical levels using many different time frames (Miller, 1985). There is no definitive answer to the question, "What caused conflict X?" Environmental conflict and security literature suggests that many constellations of variables can generate, trigger, or amplify violence and insecurity; it is therefore unproductive to seek a single causal model with universal explanatory and predictive power unless one is satisfied with a very high level of generality at all points in the model. At the same time, however, there exists today a constellation of interactive variables that, when associated with severe environmental stress, are foreboding.

But the outcome of such situations is never assured. The third dimension of this general account of the theory of environment and security concerns the remarkable capacity of communities at all scales to adjust and adapt to many forms of stress, including those related to environmental change. The simplified scarcity-conflict story culled by critics, journalists, and policymakers from the environment and security literature obscures, ignores, and (in some cases) explicitly denies this capacity. But recent human history identifies few Easter Islands (i.e., states confronted with severe environmental stress that have collapsed and disappeared) and many Haitis and Rwandas (states confronted with severe environmental stress that have collapsed and then recovered). In fact, many of the cases used to demonstrate the validity of the simple scarcity-conflict thesis are not nearly as straightforward as has been suggested.[21]

For example, in 1969 Honduras and El Salvador clashed in a conflict often attributed to land scarcity, which had pushed a large number of Salvadorans across the border into Honduras (Myers, 1993). But today it appears that both countries have found ways to adapt to continuing environmental stress. These adaptive strategies include migration to the United States, development assistance from the United Nations and other sources, bilateral development projects, and democratization. These strategies have brought in skills and knowledge, strengthened political institutions, encouraged internal and cross-border cooperation, and fostered economic growth—all of which have bolstered the adaptive capacity of these two countries.

The case of Chiapas made for a dramatic rendering of environmentally induced conflict as armed and masked guerillas fought for farmland; but this image is somewhat less gripping when it is situated in a larger time frame. Today one might well describe the conflict in Chiapas in 1994 as a single moment in a larger struggle for political power and institutional reform. From an analytical perspective, the image of Subcomandante Marcos waving a machine gun has proven less telling than the image of him marching into Mexico City to exchange his arms for political voice. It is not that the conflict was insignificant, but rather that analyses limited to the moment of conflict are incomplete.

The Turbot War between Canada and Spain is another popular example of scarcity induced conflict, one often used to show that the industrialized North is not safe from this threat. But as Beth Desombre and Samuel Barkin make clear, the larger and more accurate story is one of two states finding a viable institutional solution to the common pool resource problem of overfishing in the North Atlantic. The shots fired and ships seized were a brief and theatrical departure from decades of complex negotiations—negotiations that were reinvigorated by the clash and soon thereafter arrived at a regulatory regime satisfactory to all concerned parties.[22]

Although different researchers have focused on different parts of the general narrative presented above, it is now possible—and far more productive—to bring together some of the findings of this field. The result is not an unstable bricolage of competing and incommensurable ideas and agendas, but a potentially

powerful theory that situates contemporary environment/conflict/scarcity situations into broader histories of violence, insecurity, change, and adaptation as well as broader contexts of dynamic, interactive social and ecological forces. From this perspective, the position commonly attributed to Homer-Dixon is a chapter in a larger and more complicated story. The larger story provides potentially important bridges from the work on environmental security to at least three other contemporary research and policy foci:

Human security. The concept of human security received its most familiar early definition in UNDP's *Human Development Report 1994*:

> [S]ecurity has far too long been interpreted narrowly: as security of territory…or as protection of national interests or as global security from the threat of nuclear holocaust…Forgotten were the legitimate concerns of ordinary people who sought security in their daily lives (UNDP, 1994, p. 22).

Since it is entirely reasonable to relate the success of the modern state to its unprecedented capacity for bringing security in its most basic sense—freedom from danger—to the lives of ordinary people, this century's retreat from that constitutive role may well be deemed unacceptable and alarming.[23] The authors of the UNDP report suggest human security as a concept that can recover the earlier on-the-ground focus of the state's security practices:

> Human security can be said to have two main aspects. It means, first, safety from such chronic threats as hunger, disease and repression. And second, it means protection from sudden and hurtful disruptions in the patterns of daily life (UNDP, 1994, p. 23).

This sentiment was immediately seized upon in the environment and security field and became a guiding principle for the Global Environmental Change and Human Security Project (GECHS), established in 1996.[24] Within three years, GECHS had refined a theoretical accommodation of environmental security and human security and had set up participatory research offices in Australia, Canada, Costa Rica, Norway, and the United States. Although the concept of human security has been criticized as too broad to be analytically useful—and it certainly has not proven to have the immediate inside-the-Beltway appeal of Kaplan's "coming anarchy" thesis—its development has been steady and it has attracted a considerable number of scholars, policymakers, and activists in the developing world and Europe.[25]

Tariq Banuri, for example, offers a concise argument in defense of human security:

> [S]ecurity denotes conditions which make people feel secure against want, deprivation, and violence; or the absence of conditions that produce insecurity, namely the threat of deprivation or violence. This brings two additional elements to the conventional connotation (referred to here as political security), namely human security and environmental security (Banuri, 1996, pp. 163-164).

Banuri's conception combines (a) structural insecurities and violence associated with the world economy and the legacies of colonialism, with (b) modalities of violence and insecurity associated with environmental change—two sets of dynamics that are themselves interactive and historically related. These elements combine in today's world to ensure that large portions of humankind—primarily in the South but not exclusively so—are rarely, if ever, free from danger. That the term "human security" embodies a great deal may make it less analytically interesting to some scholars; but it would be wrong to suggest that there is not much analytical value in broad inclusive concepts that tell a compelling general story.[26] While Roland Paris notes that such inclusiveness can "hobble the concept of human security as a useful tool of analysis," he ultimately concludes that

> [d]efinitional expansiveness and ambiguity are powerful attributes of human security…human security could provide a handy label for a broad category of research…that may also help to establish this brand of research as a central component of the security studies field (Paris, 2001, p. 102).

Much of the effort to focus the concept of human security and use it as a basis for analysis has been undertaken by scholars in the field of environmental security.[27]

Globalization. The second research and policy area to which environmental security has made substantive contributions relates to the issue of globalization. Globalization is another broad and overdetermined concept that nonetheless is contemporarily powerful and valuable for both researchers and policymakers. This article defines globalization as a process driven largely by technological innovation (in the global context of expanding capitalism and democracy) that has empowered non-state actors in ways that have no precedent during the modern age of the state.[28] Globalization is characterized in large measure by an enormous increase in the speed, density, and character of cross-border transactions that sovereign states have not been able to regulate or manage (e.g. information flows and sales of goods and services via the Internet). Its impacts on fundamental human issues such as justice, security, welfare, and environmental quality have been mixed, and debate has raged over whether its negative effects will overwhelm its positive ones.[29] Transnational processes can strengthen local communities fighting injustice or insecurity; they can also exploit communities and transformed them into hubs for sex tourism or cheap labor.[30]

Much environmental security analysis investigates the ecological impacts of globalization—the negative effects these environmental changes are having on human and national security, and the transnational opportunities that exist for addressing this problem. In this regard, Peluso and Watts's *Violent Environments* is an excellent example of the way this field contributes to a more general understanding of globalization.[31]

Transnational security challenges. The third focus area to which research on environmental security contributes concerns the larger set of transnational security challenges named at the outset of this article.[32] Transnational security challenges are unconventional, non-military threats to national and human security that have been enabled or amplified by processes of technological innovation and empowerment. Some are clearly unintentional: the spread of infectious diseases like HIV; climate change; and national and regional economic problems linked to global currency trading and rapid fluctuations in the global private sector's level of confidence in a given economy. Other threats are clearly intentional, such as terrorism and computer hacking. The environment stands at the crossroads of intentionality and non-intentionality: while many dangers emanating from environmental change are the unfortunate externalities of economic processes and other human practices, the environment is also a viable conduit or target for intentional attacks by angry non-state actors.[33]

Finally, it is worth briefly noting that the literature on environment and security has also made contributions to a range of more specific intellectual, policy, and activist pursuits. For example, efforts to harness security assets to environmental goals have been praised in some quarters.[34] These efforts fall into two broad categories: (1) greening the military, and (2) making military and intelligence assets available for environmental activities. In the first case, Kent Butts argues that compliance with environmental regulations, military base clean-up, and green technology research have all increased in the U.S. Department of Defense as part of the effort to integrate environmental security into its programs. The most widely cited example of the second case is the Medea Project initiated by Vice President Al Gore, which brought together CIA analysts and civilian scientists to assess the value of archived satellite imagery for assessing phenomena such as deforestation rates and climate change. Additionally, the U.S. Army Corps of Engineers has publicized (perhaps excessively) its role in restoring the ecology of the Chesapeake Bay area; and reforestation programs have been undertaken throughout the world with military support.

Rather than look for reasons to abandon environmental security research and policy agenda, now is the time to recognize and to build on the field's remarkable achievements.

Environmental security may have had two other positive impacts on military and intelligence communities in the United States and abroad. First, it has encouraged unprecedented levels of interagency cooperation, leading to such outcomes as the 1996 Memorandum of Understanding signed by the U.S. Departments of Energy and Defense and the U.S. Environmental Protection Agency. As it becomes increasingly clear that the planning and implementation of the September 11 attacks were made easier because of the poor flows of communication within and among government

agencies such as the FBI, CIA, and INS, the 1990s experimental interagency cooperation on environmental security issues may prove very useful in reducing learning curves elsewhere. The most obvious examples of this—(a) the Medea project uniting CIA analysts and civilian scientists; and (b) the CIA's decision to establish a Center for Environmental Security that would make data available to a wider range of consumers, including non-profits and private-sector actors—have not been entirely successful. But they do provide models that can inform the next round of attempts to improve information flows and communication systems across agencies and between governmental and non-state actors.

Second, throughout the 1990s, NATO as well as the militaries of the United States, Australia, and other countries organized many workshops and conferences on the topic of environmental security. These conferences brought together representatives of many defense organizations for discussions about the need to build trust, encourage dialogue, and exchange information. Today, the war on terrorism is expanding upon such cooperative practices. Just how great a contribution these practices will make to world peace cannot be estimated today, and there are obvious concerns about intrusions of the military into other policy arenas.[35] But frank dialogue, higher levels of trust among military establishments, a sense of shared fate, trans-state networks of cooperative practices and institutions, and better information flows may ultimately lead to peaceful outcomes in at least some cases.

In addition, environmental security's language and findings can benefit conservation and sustainable development.[36] Much environmental security literature emphasizes the importance of development assistance, sustainable livelihoods, fair and reasonable access to environmental goods, and conservation practices as the vital upstream measures that in the long run will contribute to higher levels of human and state security. The Organization for Economic Cooperation and Development (OECD) and the International Union for the Conservation of Nature (IUCN) are examples of bodies that have been quick to recognize how the language of environmental security can help them. The scarcity/conflict thesis has alerted these groups to prepare for the possibility of working on environmental rescue projects in regions that are likely to exhibit high levels of related violence and conflict. These groups are also aware that an association with security can expand their acceptance and constituencies in some countries in which the military has political control. For the first time in its history, the contemporary environmental movement can regard military and intelligence agencies as potential allies in the struggle to contain or reverse human-generated environmental change. (In many situations, of course, the political history of the military—as well as its environmental record—raise serious concerns about the viability of this cooperation.)

Similarly, the language of security has provided a basis for some fruitful discussions between environmental groups and representatives of extractive industries. In many parts of the world, mining and petroleum companies have become embroiled in conflict. These companies have been accused of destroying traditional economies, cultures, and environments; of political corruption; and of using private militaries to advance their interests. They have also been targets of violence. Work is now underway through the environmental security arm of the International Institute for Sustainable Development (IISD) to address these issues with the support of multinational corporations.

Third, the general conditions outlined in much environmental security research can help organizations such as USAID, the World Bank, and IUCN identify priority cases—areas in which investments are likely to have the greatest ecological and social returns. For all these reasons, IUCN elected to integrate environmental security into its general plan at the Amman Congress in 2001. Many other environmental groups and development agencies are taking this perspective seriously (e.g. Dabelko, Lonergan & Matthew, 1999). However, for the most part these efforts remain preliminary.[37]

Conclusions

Efforts to dismiss environment and security research and policy activities on the grounds that they have been unsuccessful are premature and misguided. This negative criticism has all too often been based on an excessively simplified account of the research findings of Homer-Dixon and a few others. Homer-Dixon's scarcity-conflict thesis has made important and highly visible contributions to the literature, but it is only a small part of a larger and very compelling theory.

This broader theory has roots in antiquity and speaks to the pervasive conflict and security implications of complex nature-society relationships. The theory places incidents of violence in larger structural and historical contexts while also specifying

contemporarily significant clusters of variables. From this more generalized and inclusive perspective, violence and conflict are revealed rarely as a society's endpoint and far more often as parts of complicated adaptation processes. The contemporary research on this classical problematic has helped to revive elements of security discourse and analysis that were marginalized during the Cold War. It has also made valuable contributions to our understanding of the requirements of human security, the diverse impacts of globalization, and the nature of contemporary transnational security threats. Finally, environmental security research has been valuable in myriad ways to a range of academics, policymakers, and activists, although the full extent of these contributions remains uncertain.

Rather than look for reasons to abandon this research and policy agenda, now is the time to recognize and to build on the remarkable achievements of the entire environmental security field.

Notes

[1]Visit Global Environmental Change and Human Security at the University of California, Irvine (www.gechs.uci.edu) for a series of working papers on terrorism prepared by senior scholars and policymakers from the United States and abroad. These working papers focus on the motivations and capabilities of current terrorist networks and on how the United States is and should be responding.

[2]For examples of these assertions and commitments, see Wirth (1994), Perry (1996), Deutch (1996), Albright (1998), and Gore (1999).

[3]This threatening, neo-Malthusian image of hordes of underfed, underemployed, angry people on a rampage has been popularized in many works, including Ehrlich (1968), Kennedy & Connelly (1994), and Raspail (1995).

[4]See, for example, Dalby (1996).

[5]Portions of this summary of Homer-Dixon appeared previously in Matthew (1999).

[6]For details, see www.homerdixon.com

[7]See in particular Levy (1995), Deudney (1999), Dalby (1999), and Hartmann (2001).

[8]It is also debatable whether nonrenewable resource extraction has had more "substantial" impact on the environment than agriculture, ocean fishing, and deforestation, as Peluso and Watts (2001) assert. In a recent article, Jackson et al. (2001) argue that overfishing—that is, the excessive extraction of a renewable resource—is primarily responsible for the poor health of the world's largest ecosystem.

[9]See in particular Stoff (1980), Lipschutz (1989), Gedicks (1993; 2001), Calder (1996), Klare (2001) Collier (2000), and Le Billon (2001).

[10]The following studies make the argument that environmental scarcity can indirectly contribute to conflict under conditions in which inadequate ingenuity or social capital or wealth exists to mitigate its impacts: Baechler (1998), NATO Committee (1999), Esty et al. (1999), and de Soysa & Gleditsch (1999).

[11]The often sharp critiques of this study generally fail, however, to appreciate the complex interstate process through which it developed and its political importance as a consensus document.

[12]See, for example, Gleditsch (1998) and the response to this by Schwartz, Degliannis, & Homer-Dixon (2000). For further critiques, see Homer-Dixon (1999).

[13]See, for example, Dalby (1996).

[14]For an overview of geopolitics see O'Loughlin (1994) and Dodds & Atkinson (1999). For an introduction to critical geopolitics, which investigates the tradition of geopolitics as well as contemporary processes such as globalization, see Agnew (1998) and Tuathail, Dalby, & Routledge (1998).

[15]The volume edited by Peluso & Watts (2001) takes important steps in the direction of reintegrating some of these ideas and perspectives.

[16]See, for example, Berdal & Malone (2000).

[17]My own recent experiences in Pakistan, Cambodia, Jordan, Brazil, and Central America have suggested to me that violent conflict has a powerful historical basis that can be missed or undervalued by focusing on simple, present, measurable variables.

[18]This is not to suggest that societies have always adapted well to environmental change. Indeed, at a very high level of generality, one might well argue that the historical intensification of inequality within and among societies may be directly linked to the rate and magnitude of environmental change. In other words, as environments become more unstable and insecure, safe havens may be monopolized by relatively small groups of people that are able to use various strategies

to control access. For discussion, see Matthew, Gaulin, & McDonald (forthcoming).

[19]Among the important works in this regard are: Kahl (2000); Diehl & Gleditsch (2001); Barnett (2001); and Peluso & Watts (2001). Environment and security research also has connections to peace activism and peace studies that are ignored in its simplified versions but which are valuable and may be worth recovering. See Matthew & Gaulin (2002).

[20]See, for example, Diamond (1997) and Deudney (1999).

[21]See Matthew, Gaulin, & McDonald (forthcoming) for a full discussion of this point.

[22]See Desombre & Barkin (forthcoming).

[23]For a discussion of security and the origins of the modern state, see Poggi (1978) and Tilly & Matthew (2002).

[24]See Lonergan et al. (1999).

[25]See, for example, Thomas & Wilkins (1999), Tehranian (1999), Suhrke (1999), and Khong (2001). A more explicit union of environmental security and human security is evident in Naqvi (1996).

[26]Other concepts such as "class relations," "human rights," and "democracy" are broad and inclusive and do an enormous amount of work in contemporary political analysis.

[27]Details available at www.gechs.org

[28]That is to say, at least since 1648, when the Treaty of Westphalia acknowledged the political primacy of the sovereign state in Europe. For a pioneering discussion, see Rosenau (1990).

[29]On the primacy of the negative effects of globalization, see Kaplan (1994) and Huntington (1997). On the primacy of the positive effects, see Fukuyama (1997) and Friedman (1999). For an influential overview, see Barber (1995).

[30]Compare, for example, Wapner (1996) and Nettle & Romaine (2001).

[31]See, for example, Rajan (2001).

[32]Commonalities among transnational threats are examined in detail in Matthew & Shambaugh (1998) and updated in "Al-Qaeda versus McWorld" (2002). On this topic, see also Klare & Thomas (1994); Klare (2001); Williams & Black (1994); and the special issue of *National Security Studies Quarterly* on new security threats (IV: 4, Autumn 1998). The ease with which specialists in environmental security have brought their analytical expertise to bear on the challenge of terrorism is evident in the recent work by Thomas Homer-Dixon.

[33]See Chalecki (2002).

[34]See, for example, Butts (1999).

[35]On this see Deudney (1999) and Dalby (1996).

[36]This issue is well-covered in Halle et al. (forthcoming).

[37]Some attempts to help establish priorities by mapping areas of high vulnerability have received considerable attention. See, for example, Lonergan, Gustavson, & Carter (2000).

References

Agnew, John. (1998). *Geopolitics*. London: Routledge.

Albright, Madeleine. (1998, April 21). "Earth Day 1998: Global problems and global solutions." Remarks on Earth Day 1998 at the National Museum of Natural History, Washington, DC. [On-line]. Available: http://secretary.state.gov/www/statements/1998/980421.html

Baechler, Günther. (1998). "Why environmental transformation causes violence." *Environmental Change and Security Project Report 4*, 24-44.

Banuri, Tariq. (1996). "Human security." In Nauman Naqvi (Ed.), *Rethinking security, rethinking development* (pages 163-167). Islamabad: Sustainable Development Policy Institute.

Barber, Benjamin. (1995). *Jihad vs. McWorld: How globalism and tribalism are reshaping the world*. New York: Ballantine.

Barnett, Jon. (2001). *The meaning of environmental security: Ecological politics and policy in the new security era*. London: Zed Books.

Berdal, Mats & Malone, David. (Eds.). (2000). *Greed and grievance: Economic agenda in civil wars.* Boulder: Lynne Rienner.

Bobrow-Strain, Aaron. (2001). "Between a ranch and a hard place: Violence, scarcity, and meaning in Chiapas, Mexico." In Nancy Lee Peluso & Michael Watts (Eds.), *Violent environments* (pages 155-185). Ithaca: Cornell University Press.

Butts, Kent. (1999). "The case for DOD involvement in environmental security." In Daniel Deudney & Richard A. Matthew (Eds.), *Contested grounds: Security and conflict in the new environmental politics* (pages 109-126). Albany: SUNY Press.

Calder, Kent. (1996, March/April). "Asia's empty tank." *Foreign Affairs 75,* 55-68.

Chalecki, Beth. (2002, February). "A new vigilance: Identifying and reducing the risks of environmental terrorism." *Global Environmental Politics 2*(1), 46-64.

Collier, Paul. (2000, June 15). "Economic causes of civil conflict and their implications for policy." A paper for the World Bank Group. [On-line]. Available: http://www.worldbank.org/research/conflict/papers/civilconflict.pdf

Dabelko, Geoffrey D.; Lonergan, Steve; & Matthew, Richard. (1999). *State of the art review on environment, security and development cooperation*. IUCN/OECD. [On-line]. Available: http://www.iisd.org/pdf/2002/envsec_oecd_summary.pdf

Dalby, Simon. (1996). "The environment as geopolitical threat." *Ecumene 3*(4), 472-96.

Dalby, Simon. (1999). "Threats from the south? Geopolitics, equity, and environmental security." In Daniel Deudney & Richard A. Matthew (Eds.), *Contested grounds: Security & conflict in the new environment politics* (pages 155-185). Albany: SUNY Press.

Desombre, Beth & Barkin, Samuel. (Forthcoming). "The Turbot war." In Mark Halle, Richard Matthew, & Jason Switzer (Eds.), *Conserving the peace*. Geneva: IISD.

Deudney, Daniel H. (1999). "Bringing nature back in: Geopolitical theory from the Greeks to the global era." In Daniel H. Deudney & Richard A. Matthew (Eds.), *Contested grounds: Security and conflict in the new environment politics* (pages 25-57). Albany: SUNY Press.

Deudney, Daniel H. (1999). "Environmental security: A critique." In Daniel Deudney & Richard A. Matthew (Eds.), *Contested grounds: Security and conflict in the new environmental politics* (pages 187-219). Albany: SUNY Press.

Deutch, John. (1996, July 25). "The environment on the intelligence agenda." Speech presented to the World Affairs Council. [On-line]. Available: http://www.odci.gov/cia/public_affairs/speeches/archives/1996/dci_speech_072596.html

Diamond, Jared. (1997). *Guns, germs, and steel: The fates of human societies.* New York: Norton.

Diehl, Paul & Gleditsch, Nils Petter. (Eds.). (2001). *Environmental conflict*. Boulder, CO: Westview Press.

Dodds, Klaus & Atkinson, David. (1999). *Geopolitical traditions: Critical histories of a century of geopolitical thought*. London: Routledge.

Ehrlich, Paul R. (1968). *The population bomb*. New York: Ballantine.

Esty, Daniel C.; Goldstone, Jack A.; Gurr, Ted Robert; Harff, Barbara; Levy, Marc; Dabelko, Geoffrey D.; Surko, Pamela T.; & Unger, Alan N. (1999). "State failure task force report: Phase II findings." *Environmental Change and Security Project Report 5,* 49-72.

Fagan, Brian. (1999). *Floods, famines, and emperors: El Nino and the fate of nations.* New York: Basic.

Friedman, Thomas L. (1999). *The Lexus and the olive tree.* New York: Farrar, Straus, Giroux.

Fukuyama, Francis. (1997). "The end of history?" In Foreign Affairs Agenda, *The New Shape of World Politics* (pages 1-25). New York: Norton.

Gedicks, Al. (1993). *New resource wars: Native and environmental struggles against multinational corporations.* Cambridge: South End Press.

Gedicks, Al. (2001). *Resource rebels: Native challenges to mining and oil corporations.* Cambridge: South End Press.

Gleditsch, Nils Petter. (1998). "Armed conflict and the environment: A critique of the literature." *Journal of Peace Research 35,* 381-400.

Gore, Albert. (1999, January 29). "Remarks prepared for the World Economic Forum, Davos." [On-line]. Available: http://clinton3.nara.gov/WH/EOP/OVP/speeches/davos.html

Halle, Mark; Matthew, Richard; & Switzer, Jason. (Eds.). (Forthcoming). *Conserving the peace.* Geneva: IISD.

Hartmann, Betsy. (2001). "Will the circle be unbroken?" In Nancy Lee Peluso & Michael Watts (Eds.), *Violent environments* (pages 39-62). Ithaca: Cornell University Press.

Hauge, Wenche & Ellingsen, Tanya. (1998). "The causal pathway to conflict: Beyond environmental security." *Journal of Peace Research 35,* 299-317.

Homer-Dixon, Thomas. (1991). "On the threshold: Environmental changes as causes of acute conflict." *International Security 16,* 76-116.

Homer-Dixon, Thomas. (1994). "Environmental scarcities and violent conflict. Evidence from cases." *International Security 19*, 5-40.

Homer-Dixon, Thomas. (1999). *Environment, scarcity and violence.* Princeton: Princeton University Press.

Homer-Dixon, Thomas & Blitt, Jessica. (Eds.). (1998). *Ecoviolence: Links among environment, population and security.* Lanham:

Rowman and Littlefield.

Huntington, Samuel. (1997). "The clash of civilizations?" In *The New Shape of World Politics: Contending Paradigms in International Relations* (pages 67-91). New York: Norton.

Jackson, Jeremy B.C.; Kirby, Michael X.; Berger, Wolfgang H.; Bjorndal, Karen A.; Botsford, Louis W.; Bourque, Bruce J.; Bradbury, Roger H.; Cooke, Richard; Erlandson, Jon; Estes, James A.; Hughes, Terence P.; Kidwell, Susan; Lange, Carina B.; Lenihan, Hunter S.; Pandolfi, John M.; Peterson, Charles H.; Steneck, Robert S.; Tegner, Mia J.; & Warner, Robert R. (2001, July 27). "Historical overfishing and the recent collapse of coastal ecosystems." *Science 293*(5530), 629.

Kahl, Colin. (2000). *States, scarcity, and civil strife in the developing world*. Unpublished doctoral dissertation. New York: Columbia University.

Kaplan, Robert. (1994, February). "The coming anarchy: How scarcity, crime, overpopulation, and disease are rapidly destroying the social fabric of our planet." *The Atlantic Monthly*, 44-76.

Kennedy, Paul & Connelly, Matthew. (1994, December). "Must it be the west against the rest?" *The Atlantic Monthly*, 61-83.

Khong, Yuen Foong. (2001, July/September). "Human security: A shotgun approach to alleviating human misery?" *Global Governance* 7(3), 231-236.

Klare, Michael & Thomas, Daniel C. (Eds.). (1994). *World security: Challenges for a new century.* New York: St. Martin's Press.

Klare, Michael. (2001). *Resource wars: The new landscape of global conflict.* New York: Henry Holt.

.

Le Billon, Philippe. (2001). "The political ecology of war: Natural resources and armed conflicts." *Political Geography 20,* 561-584.

Levy, Marc. (1995). "Is the environment a national security issue?" *International Security 20,* 35-62.

Lipschutz, Ronnie. (1989). *When nations clash: Raw materials, ideology and foreign policy.* New York: Ballinger.

Lonergan, Steve; Brklacich, Mike; Cocklin, Chris; Gleditsch, Nils Petter; Gutierrez-Espeleta, Edgar; Langeweg, Fred; Matthew, Richard; Narain, Sunita; & Soroos, Marvin. (1999). *Global environmental change and human security science plan*. (IHDP Report 11). Bonn, Germany: International Human Dimensions Programme on Global Environmental Change.

Lonergan, Steve Gustavson, Kent; & Carter, Brian. (2000). *AVISO 6: The index of human insecurity*. [On-line]. Available: http://www.gechs.org/aviso/AvisoEnglish/six.shtml

Matthew, Richard. (1999). "Recent books on environment, conflict and security." *Journal of Political Ecology 6*. [On-line]. Available: http://dizzy.library.arizona.edu/ej/ipe/volume_6/matthewvol6.html

Matthew, Richard & Gaulin, Ted. (2002). "The ecology of peace." *Peace Review 14,* 33-39.

Matthew, Richard; Gaulin, Ted; & McDonald, Bryan. (Forthcoming). "The elusive quest: Linking environmental change and conflict." *Canadian Journal of Political Science*.

Matthew, Richard & Shambaugh, George. (1998, Summer). "Sex, drugs and heavy metal: Transnational threats and national vulnerabilities." *Security Dialogue 29,* 163-175.

Matthew, Richard & Shambaugh, George. (2002). "Al Qaeda versus McWorld: A third front in the war on terrorism." (GECHS Working Paper). Irvine, CA: University of California-Irvine.

McNeill, John. (2000). *Something new under the sun: An environmental history of the twentieth century world*. New York: Norton.

Miller, Steven E. (1985). *Military strategy and the origins of the First World War.* Princeton: Princeton University Press.

Myers, Norman, (1993). *Ultimate security: The environmental basis of political stability.* New York: Norton.

Naqvi, Nauman. (Ed.). (1996). *Rethinking security, rethinking development*. Islamabad: Sustainable Development Policy Institute.

NATO's committee on the challenges of modern society. (1999). *Environment and security in an international context*. Brussels: NATO.

Nettle, Daniel & Romaine, Susan. (2001). *Vanishing voices: The extinction of the world's languages.* Oxford: Oxford University Press.

O'Loughlin, John. (Ed.). (1994). *The Dictionary of Geopolitics*. Westport, CT: Greenwood.

Osborn, Fairfield. (1948). *Our plundered planet*. New York: Grosset and Dunlap.

Paris, Ronald. (2001, Fall). "Human security: Paradigm shift or hot air?" *International Security 26,* 87-102.

Peluso, Nancy Lee & Watts, Michael. (2001). *Violent environments*. Ithaca: Cornell University Press.

Perry, William. (1996, November 20). "Remarks on environmental policy presented to the Society of American Military Engineers, Washington, D.C." [On-line]. Available: http://www.defenselink.mil/news/Nov1996/b112096_bt650-96.html

Poggi, Gianfranco. (1978). *The development of the modern state: A sociological introduction*. Stanford: Stanford University Press.

Ponting, Clive. (1991). *A green history of the world: The environment and the collapse of great civilizations.* New York: Penguin.

Rajan, S. Ravi. (2001). "Toward a metaphysic of environmental violence: The case of the Bhopal gas disaster." In Nancy Lee Peluso & Michael Watts (Eds.), *Violent environments* (pages 380-398). Ithaca: Cornell University Press.

Raspail, Jean. (1995) *The camp of the saints*. (Trans. Norman Shapiro). Petoskey, MI: The Social Contract Press.

Rosenau, James. (1990). *Turbulence in world politics: A theory of continuity and change.* Princeton, Princeton University Press.

Schwartz, Daniel M.; Degliannis, Tom; & Homer-Dixon, Thomas. (2000). "The environment and violent conflict: A response of Gleditsch's critique and some suggestions for future research." *Environmental Change and Security Project Report 6,* 77-94

.

de Soysa, Indra & Gleditsch, Nils Petter. (1999). "To cultivate peace: Agriculture in a world on conflict." *Environmental Change and Security Project Report 5,* 15-33.

Stoff, Michael. (1980). *Oil, war and American security.* New Haven: Yale University Press.

Suhrke, Astri. (1999, September). "Human security and the interests of states." *Security Dialogue 30,* 265-276.

Tehranian, Majid. (Ed.). (1999). *Worlds apart: Human security and global governance.* London: I.B. Tauris.

Thomas, Caroline & Wilkins, Peter. (Eds.). (1999). *Globalization, human security and the African experience.* Boulder: Lynne Rienner.

Tuathail, Gearoid Ó; Dalby, Simon; & Routledge, Paul. (Eds.). (1998). *The geopolitics reader.* London: Routledge.

Tilly, Charles & Matthew, Richard. (2002). *Dichotomy of power: State versus nation in world politics.* Lanham: Rowman and Littlefield.

United Nations Development Programme (UNDP). (1994). *Human development report 1994*. Oxford: Oxford University Press.

Wapner, Paul. (1996). *Environmental activism and world civic politics.* Albany: SUNY Press.

Williams, Phil & Black, Stephen. (1994, April). "Transnational threats: Drug trafficking and weapons proliferation." *Contemporary Security Policy 15,* 127-151.

Wirth, Timothy. (1994, July 14). "Sustainable development vital to new U.S. foreign policy." Speech presented to National Press Club. Washington, DC: Author.

World Commission on Environment and Development. (1987). *Our common future*. Oxford: Oxford University Press.