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**Global Environmental Politics**

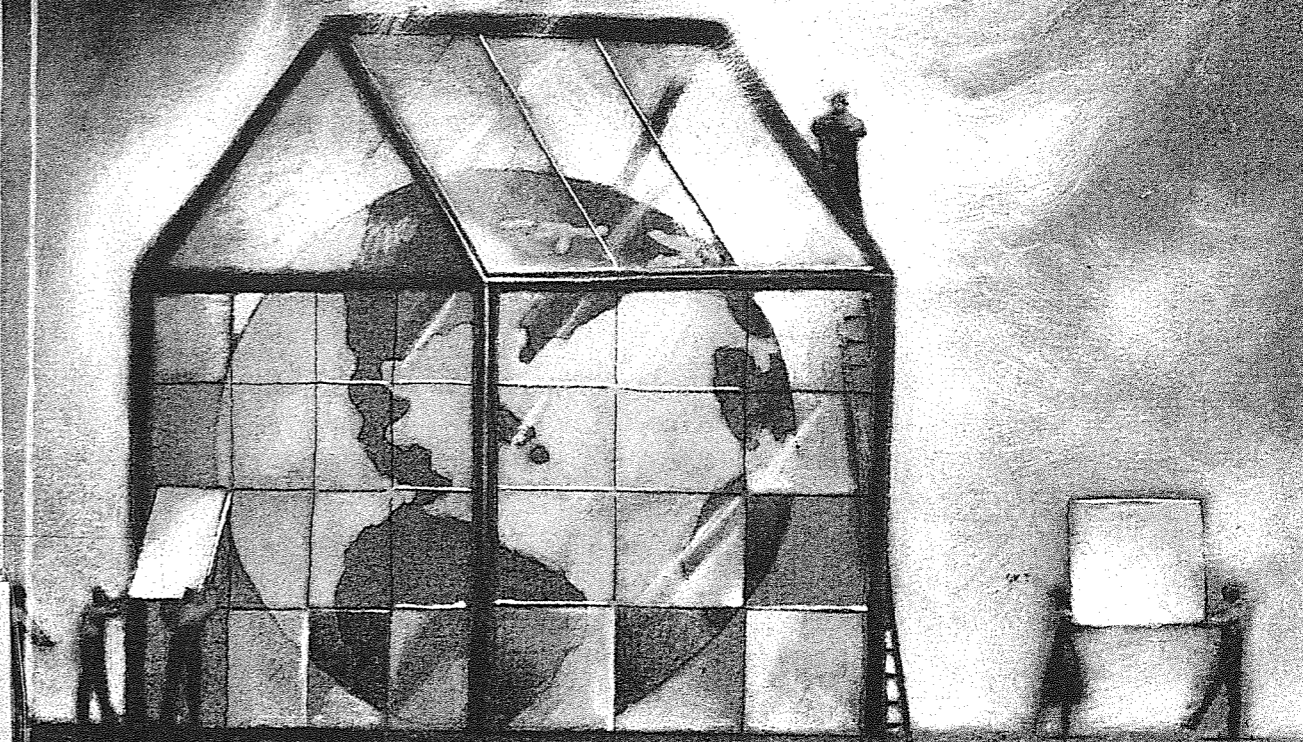
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# Environmental Politics

THEORIES AND CASE STUDIES



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## 4 Environmental security

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Of the various topical issues often associated with the non-traditional security school (i.e. disease, immigration, poverty, etc.), the environment has received the most scrutiny. Pundits, policy-makers, and academics have all reflected on the so-called environmental security subfield. Lester Brown's (1977) *Worldwatch* piece is probably most recognized for bringing this issue to the fore. But writings have generally taken two opposing sides in discussing the relationship between security and the environment.

Generally, proponents of linking the terms "environment" and "security" point to the roots of resource scarcity and environmental degradation in promoting intrastate and interstate violent conflict and wars. Both theoretical and empirical studies have considered this relationship, particularly in the developing world (Homer-Dixon 1999; Hauge and Ellingsen 1998). The link between the environment and human security has likewise been touted (Najam 2003). To that extent, these non-traditionalist thinkers believe that the traditional definition of security, restricted to the polemics of state sovereignty, military affairs between states, and the threat of interstate war as a function of threats to territorial integrity, should be expanded to include other issues, such as the environment (Mathews 1989). These analysts have also regarded the linkage itself important in elevating environmental issues to the forefront of national security affairs, creating the political urgency to resolve environmental problems (Ullman 1983).

Critics of the linkage between the concepts of environment and security generally dismiss the relationship on several grounds. First and foremost, these analysts (regarded as traditionalist thinkers) believe that expanding the definition of security, as it is traditionally regarded, threatens the viability and parsimoniousness of the concept (Walt 1991). Others criticize the link, claiming that the environment is antithetical to everything society often regards as security, and for that reason connecting the two concepts will prevent us from thinking critically about dealing with environmental problems (Deudney 1999).

Another important, yet often forgotten, element of discussion is the cooperative side of the environment and security coin (Diehl and Gleditsch 2001: 4). In other words, security is likewise advanced if successful cooperation resolves a particular environmental dispute which may contribute to instability or reduces the well-being of countries (Esty 1999; Brock 1992).

If cooperation (like conflict) is to become an important analytical concept in the subfield of environmental security, then we must better understand how and when scarcity and degradation affect interstate coordination and how environmental negotiations succeed or fail (Ostrom *et al.* 1999; Young 1989, 1994; Barrett 2003). Since international environmental negotiations often take place among asymmetric and unequal parties, understanding how such country differences may challenge environmental cooperation is also paramount. Consequently, including such elements of bargaining and treaty design in the study of cooperation allows for a more

comprehensive consideration of the concept of environmental security and likewise highlights its important place in the larger field of global environmental politics.

### Environment and security in context

The subfield of environmental security emanated from a flurry of interest in environmental issues and related writings that appeared in the late 1960s and early 1970s. Writings by Paul Ehrlich (1968) and Garrett Hardin (1968) underscored the magnitude of the environmental crisis related to such issues as exponential population growth and the "tragedy of the commons." At the same time, the 1972 United Nations Conference on the Environment held in Stockholm – and the related Stockholm Declaration (UNEP 1972) – placed environmental issues on the global agenda, setting the stage for such important international institutions as the United Nations Environmental Programme (Matthew 1999: 4). This important institutional development later ushered in another global meeting, the 1992 Conference on Environment and Development in Rio de Janeiro – and the related Rio Declaration (UNEP 1992) – which also elaborated on the concept of sustainable development (Matthew 1999: 5).

According to Dabelko (2004: 3), however, interest in environment and security issues truly solidified in the mid-1990s. For one, the findings of Thomas Homer-Dixon's investigation into the links between environmental scarcity and acute conflict were published in the influential scholarly journal *International Security* (Homer-Dixon 1991, 1994). In 1994, the *Atlantic Monthly* featured Robert Kaplan's provocative article "The coming anarchy" (Kaplan 1994), which also brought the topic of environmental security to the wider public and policy circles by considering how environmental change was leading to intrastate and interstate conflicts.

That same year the term "human security" was touted by the United Nations Development Programme, through its *Human Development Report*, emphasizing the security of the individual with linkages to the environment. Perhaps most striking in the more recent history of environmental security, however, was the establishment of the Environmental Change and Security Program (ECSP) at the Woodrow Wilson International Center for Scholars in 1994. To this day, ECSP has been transcending both the academic and policy worlds in an effort to bring attention and focus to the security aspects of environmental change, conflict, and cooperation (Dabelko 2004: 3).

Interestingly, throughout the evolution of the concept of environmental security, and its interconnected issue areas, a lively debate has been taking place in the background. In particular, scholars and policy-makers have been deliberating the utility and ramifications of linking the terms "environment" and "security." This debate has been couched in a more general discussion between so-called traditionalists and non-traditionalists of security studies.

### Debating environment and security: traditionalists, non-traditionalists, critics, and proponents

The debate between traditional security thinkers and non-traditional security thinkers stems largely from the various assumptions each side makes about international politics and the importance each side places on particular actors and phenomena in the international system. Yet the academic debate has also had its share of influence on policy. Rothschild (1995: 57–9) identifies four such impacts: providing direction and guidance to policies of government officials; guiding public opinion about policy; contesting existing principles; and influencing directly the distribution of money and power. These four principles have likewise

undergirded the debate between scholars who support linking "environment" and "security" and those who oppose it.

#### *Traditionalists and non-traditionalists*

Traditionalists argue in favor of the primacy of military security as a goal of nation-states (Morgenthau 1948: 121). Accordingly, security is the study of the threat, use, and control of military force. The field of security studies, according to traditionalists, explores the conditions that make the use of force more likely and the policies that states adopt in order to prepare for, prevent, or engage in war (Walt 1991: 212). Given the anarchic international system, military security and survival are paramount and should supersede other non-military issues (Waltz 1979: 126). Based on a realist world view, the traditionalist argument holds that the nation-state is the ultimate unit of analysis, defending itself in a self-help system.

Non-traditionalists expand the definition of security to encompass a variety of threats faced by nations, individuals, and the international system. Wolfers, for example, is quick to point out that the security concerns of traditionalists, while legitimate, should not crowd out other issues of import. In fact, despite the realist and neo-realist contentions that a state's "survival" is paramount, not all states are faced with the same degree of danger and consequently do not act uniformly (Wolfers 1952: 486). In other words, states face different dangers and concerns that in turn affect their individual security.

As a challenge to the military-centric and state-centric view of traditionalists, non-traditionalists support the essence of complex interdependence, essentially arguing that there is no hierarchy of issues and that military security should not consistently dominate the agenda (Keohane and Nye 1989: 24–5). Buzan *et al.* (1998), for example, maintain that the field of security studies should be reconceptualized beyond the limits placed on it by traditional scholars. Security involves perceived threats to the survival of some highly valued referent object. Such objects may involve state and non-state actors, abstract principles, and nature itself. The authors also submit that threats may come from various sources, including other states or natural phenomena and trends such as the environment (*ibid.*: 23). In another attempt to define security more broadly, Ullman (1983) has suggested that a danger to national security is that which: a) threatens drastically and over a brief span of time to degrade the quality of life for the inhabitants of a state, and b) threatens significantly to narrow the range of policy choices available to the government and different groups within the state. The definition of security has also been expanded to account for the individual and the community, rather than just the nation-state (UNDP 1994; Suhrke 1999; Najam 2003).

Non-traditionalists are steadfast in their claim that the traditional school of security studies seems poorly equipped to deal with the realities of the post-Cold War world, maintaining a narrow military conception of national security that excludes other public policy goals. Its sole preoccupation with military statecraft and sovereignty limits its ability to address the many foreign and domestic problems that either are not amenable to military solutions or that underlie interstate or intra-state problems and lead to conflict, military or otherwise (Baldwin 1997: 16; Ullman 1983: 133–5). Haftendorn (1991) concurs, arguing that the traditionalist definition of security doesn't describe current security affairs. What is needed, she asserts, is a new paradigm of security that can explain changes in various regions and is not limited to a single issue area or level of analysis (*ibid.*: 12–13).

Traditionalists, on the other hand, claim that, while issues unrelated to war (such as disease, poverty, and the environment) are important, they should not be regarded as part of the

definition of security as they "destroy its intellectual coherence and make it more difficult to devise solutions to any of these important problems" (Walt 1991: 213). Paris (2001: 88), criticizing the concept of human security, claims that the definition tends to be too expansive and vague, encompassing a multitude of physical and psychological aspects. In turn, this impreciseness leaves policy-makers with little guidance in the prioritization of competing policy goals and academics with little sense of what needs to be studied.

The environmental component of security studies has been couched largely in the context of the non-traditional school. Yet debate has raged here as well, with regard to linking these two concepts. Interestingly, circles of the environmentally concerned have voiced the most reservations (Soroos 1994: 319).

#### *Environmental security: proponents and critics*

##### PROPONENTS

Environmental security issues have generally transcended the individual, national, and international levels. On the individual level, scholars have argued that environmental change may undermine human security by reducing access to, and the quality of, natural resources that are important to sustain livelihoods (Renner 1996; Barnett *et al.* 2008; Barnett and Adger 2007). On the national or intrastate level, scholars have considered the manner by which resource scarcity and environmental degradation have their social effects and in turn could lead to violent conflicts within states, either among differing ethnic groups or among certain classes of society vying for scarce resources (Homer-Dixon 1999).<sup>1</sup> Accordingly, environmental change could have alarming repercussions, particularly when these threaten political outcomes affecting the viability of state boundaries, state institutions, or governing elites, or when they weaken the capacity of states and regimes to act effectively (Mathews 1989: 175; Myers 1993: 24–5; Ullman 1983: 141–3). While it is more likely that environmental degradation tends to affect human security or instigate violent intrastate conflict in the developing world, indirect effects could very well be felt in the developed world. Scholars have suggested that the consequence of environmental degradation and violent conflict (such as migration waves, impacts on trade, and regime instability) could affect the developed world, both politically and economically, and its policies toward the developing world (de Serbinin 1995; Esty 1999; Allenby 2000; Ferraro 2003; Rice *et al.* 2006).

On the international level, studies have claimed that resource scarcity and degradation could likewise lead to violent conflict between states and, at the very worst, wars (Westing 1986; Mandel 1988; Bächler and Spillman 1996; Bächler 1998; Klare 2001). Other studies have taken a more nuanced approach to the study of interstate conflict over resource scarcity and environmental degradation, considering the political and non-violent disputes that take place and their relationship to security (Goldstone 2001; Lipschutz and Holdren 1990). The effects of climate change, transboundary air pollution, and biodiversity depletion have been analyzed largely in this context (Benedick 1998; NICGC 2000; McNeely 2005; IPCC 2007; Jopp and Kaestner 2008).<sup>2</sup>

Beyond theoretical and case-study approaches that have contributed to the study of environmental security, empirical works have also provided great insight – further attesting to the security aspects of environmental issues across a large spectrum of observations. The majority of these empirical studies consider the intrastate nature of violence as a consequence of resource scarcity and environmental degradation, while the majority of the studies that consider the relationship in an interstate context investigate conflict over freshwater and international rivers.

Hauge and Ellingsen (1998) provide perhaps one of the first large quantitative examinations of the environment–conflict contention. While their work pertains to the intrastate level, the authors find a positive correlation between such variables as water scarcity, deforestation, and civil conflict. More recently, Levy *et al.* (2005) consider the effects of climate change on civil wars. The authors find that decreased rainfall has a positive effect on intrastate conflicts. Finding somewhat weaker results for the effects of climate change on civil conflict, Raleigh and Urdal (2007) reveal that such variables as population growth, population density, water scarcity, and land degradation have, nonetheless, a very moderate effect on the risk of civil conflict.

Building on Choucri and North's (1975) lateral pressure theory, Tir and Diehl (1998) find a modest relationship between population pressures (which accelerate resource depletion and decrease economic growth) and the likelihood of interstate conflict. Focusing on shared rivers, Tostet *et al.* (2000: 992–3) find that, while water scarcity is not necessarily the only, or the main, issue in explaining armed conflict, "low availability of water in both countries of the dyad is significantly related to disputes." Although Gleditsch *et al.* (2006: 376) find some ambiguity pertaining to this relationship, their findings suggest that countries experiencing low average rainfall have a higher risk of interstate conflict. Specifically, focusing on competing claims over cross-border rivers, Hensel *et al.* (2006: 390) also conclude that interstate militarized disputes are more likely to take place in regions where water is more scarce. The authors contend that resource-poor areas are environments where the creation of institutions to manage conflict will be lacking and/or ineffective (*ibid.*: 385, 388, 408–9). Specifically, between the years 1900 and 2001 the authors find seventeen occasions where water disputes turned violent.

True for most all of the above-mentioned studies are the associated political and economic factors that are likewise important for understanding conflict. This does not deny the importance of environmental factors in explaining conflict or instability but does suggest that economic and political variables often exacerbate (or mitigate) conflict. Therefore, the extent to which resource sovereignty is ill-defined, the governing regime does not employ farsighted decisions *vis-à-vis* environmental stewardship, the country suffers from relative underdevelopment, existing institutions are weak or debilitated by political turmoil, and that environmental change outpaces the capacity of existing institutions to deal with that change, will affect the extent and severity of conflict (Gleditsch 1998; Giordano *et al.* 2005).

#### CRITICS

Scholars that criticize the environment and security link often adopt the traditional definition of security. Consequently, they claim that, if all the forces that threaten life, property, and well-being are considered as threats to national security, the term itself will be drained of any meaning (Deudney 1991: 23–4). Deudney (1999), for example, suggests that it is analytically misleading to think of environmental degradation as a national security threat because the traditional focus of national security has little in common with environmental problems or solutions. Furthermore, by depicting the environment as a legitimate security concern, scholars may help justify military action on environmental grounds (Brock 1992: 95). Since traditional security is likewise associated with nationalism and sovereignty, attempts to harness global action, which environmental problems demand, are undermined. In other words, environmental problems and solutions are global in nature and are therefore the antithesis of the nation-state just as much as the nation-state is the antithesis of the emerging global environmental agenda (Stern 1999: 138).

Finally, such scholars also claim that environmental degradation is not likely to cause interstate wars (Deudney 1999; Barnett 2000). Rather, human ingenuity mitigates against conflict in the face of scarcity (Simon 1981). Other rejectionists of the connection between environment and security also tend to dismiss any direct causal link between environmental problems and security. They cite the (above-mentioned) political, economic, and institutional components of a state or society as more important in understanding how violent conflicts may take place. Despite acknowledgement by proponents that political and economic factors indeed play an important role in explaining the likelihood of conflict (Homer-Dixon and Levy 1995–6), critics still claim that it is often very difficult to isolate those environmental components or that environmental degradation merely serves as a side effect. To the extent that environmental change is causative rather than associative, the tangled chains of causation may prove to be intractable for analysis or turn out to be highly situation-dependent (Critchley and Terriff 1993: 337).

Critics also claim that those who link environmental issues with security studies are engaged in a rhetorical ploy simply to depict environmental issues in a new manner. They view this effort as an attempt to hijack the security issue in order to capture the attention of politicians and the public, both of whom, they believe, may pay deference to it (Levy 1995: 45).

Another criticism considers the Northern biases of the term "environmental security." In other words, globalization, modernity, industrialization, and the diffusion of global capital have had serious economic, political, and environmental effects on the global South or developing world. To that extent, by using the concept of environmental security the industrialized world is essentially maintaining the status quo rather than acknowledging the essential changes that need to be undertaken to alleviate environmental problems. In addition, the focus should be on the global North – to a large degree the main producer of such environmental problems (Barnett 2000; Dalby 2002; Watts 2004).

Finally, it is also claimed that, because environmental degradation may actually lead to cooperation and joint efforts by countries to deal with that degradation, the environment simply cannot be associated with a concept such as security (Thorsell 1990; Deudney 1999; Barnett 2000). In other words, environmental issues engender global action, interdependence, and international cooperation while the concept of security engenders such ideas as sovereignty and nationalism.

#### Concluding thoughts on the debate

Clearly, the concept of environmental security has invited much debate. Yet critics of the term seem to focus principally on realist influences pertaining to the security field. This may be unwarranted. First, the concept of security has always been characterized by a relatively ambiguous definition (Wolfers 1952; Goldstone 1996). In fact, considering the history of the concept of security reveals its multifaceted and multilevel dimensions, which included the individual and the state (Rothschild 1995: 62–3, 66–7; Brauch 2008: 75–6). Second, the concept of security does not necessitate a sole focus on the state. The lens is also open to non-state actors and domestic forces. Indeed, environmental issues require the participation of a multitude of actors so as to achieve effective implementation of environmental governance (see, for example, Conca 2006). Still, this does not deny the important role of the state in international environmental stewardship, especially given the transboundary nature of many environmental problems and the need for coordinated state action. Third, perhaps one of the most important contributions of the concept of environmental security has been to elevate environmental issues to the realm of high politics and the public interest (Græger

1996: 111). Presently, climate change is high on the agenda, as evidenced, for example, in the recent National Intelligence Assessment (House of Representatives 2008). While the Assessment finds that few direct effects of climate change will be felt in the United States before 2030, the most significant impact will be in the form of climate-driven events on other countries, which will affect these states' economic development levels, agricultural productivity, and lead to out-migration. This will in turn have security ramifications for the United States. (Whether the securitization of climate change has had the desired effects on policy-making, however, is yet to be seen.)

Finally, and as is the focus of the following section, it is precisely because environmental degradation and resource scarcity necessitate and motivate cooperation, and cooperation in turn may reduce instability, that the concepts of environment and security are not in opposition to one another. Environmental collective prevention and environmental collective defense (Soroos 1994: 323–4) are at the heart of international cooperation and in turn are at the core of environmental security. As Pirages and DeGeest (2004) contend, ecological change and increasing environmental vulnerability are progressively shaping the future of an emerging global system. These environmental phenomena necessitate an eco-revolutionary perspective that requires foresight and anticipatory thinking to "avoid the harsh consequences of failing to recognize emerging problems and issues that could generate tragedies in the long run" (ibid.: 5–6). These consequences are linked to globalization, famine, development strategies, and the gap between North and South. At the same time, promoting ecological security requires a type of global governance inclusive of non-governmental organizations and international institutions. Simultaneously, a coherent governance is likewise necessary in forging agreements that deal with the many issues related to ecological security (ibid.: 226).

#### Cooperation, security, and the environment

Telling for this general debate between traditional and non-traditional security scholars and opponents and proponents of the environmental security term are Benjamin Miller's thoughts on the definition of security. Miller, a realist, seems to depart from the traditional perspective of security studies, suggesting that realists make two errors by minimizing the concept. First, they de-emphasize peace as an important component of the security field and, second, they diminish non-military causes or means affecting national as well as regional and international security (Miller 2001: 14). In line with the above discussion on environmental security, Miller claims that "environmental degradation should be part of the security field only to the extent that environmental factors affect the likelihood of armed conflict, namely war and peace" (ibid.).

Indeed, Miller departs from the main traditionalist qualms relevant to expanding the concept of security by emphasizing peace and non-military causes of international (in)stability. To that extent he seems to be in agreement with some of the above scholars who consider how natural resources or resource scarcity may lead to interstate and intrastate violent conflict. However, since Miller considers only the occurrence (or absence) of war and violence as the dependent variable to depict the nature of security, he dismisses other important elements. Ignored are circumstances or environmental issues that transcend simple violent conflict, such as conflicts of interest or political disputes (Goldstone 2001). In addition, while Miller discusses the value of the peace side of the security coin, he effectively ignores another important component of that same side – cooperation. In other words, other elements associated with peace and stability more generally, such as interstate cooperation on other common fronts such as the environment, are sidelined (Conca and Dabelko 2002;

Brauch 2008: 71–4). Since environmental issues may cause conflict or instability, resolving them is equally important. Given that countries are interdependent by the sheer environmental resources that they share, diplomacy, cooperation, and regulatory regimes are necessary to manage these resources and coordinate state actions (Mathews 1989: 174–7).

While some evidence exists as to the relationship between environmental change, resource scarcity, and interstate conflict, there seems to be more support for the argument that (formal) violent conflict over scarce resources is a relative anomaly in the international (interstate) arena. Interestingly, this claim is also in line with the ideas of those critics of the concept of environmental security (Deudney 1999; Barnett 2000; Dalby 2002). This assessment is most clear in the context of freshwater, as academia has largely rejected the popular "water wars" theory (Wolf and Hamner 2000). In particular, Wolf and Hamner have claimed that "the more valuable lesson of international water is as a source whose characteristics tend to induce cooperation and incite violence only in the exception" (ibid.: 66).

Yet just because physical violence on the interstate level is not likely to be a result of resource scarcity or environmental degradation does not mean security is uncompromised. This type of non-violent conflict, a consequence of environmental degradation and resource scarcity, is likewise relevant for the concept of security as it may create regional and international tensions or perhaps exacerbate other existing tensions unrelated to the environment. Depending on the environmental issue or the respective resource under discussion, such political tensions are especially likely to escalate further in regions with less institutional capacity or a less salient history of cooperation among the protagonists. It is perhaps of little surprise that the great majority of escalated interstate tensions over freshwater, for example, have taken place in the Middle East, North Africa, and Central Asia (Horsman 2001; Hensel *et al.* 2006). As mentioned above, other environmental goods and resources, which are more likely to instigate political dispute between states, or have various consequences for security, include climate change, ozone depletion, transboundary air pollution, and biodiversity. Cooperation, in turn, may work to reduce those non-violent (or violent) tensions and consequently advance regional and international stability and security.

Recall that various critics of the environmental security concept made exactly this claim in an effort to discount the relationship between the concepts of environment and security. Daniel Deudney (1999: 203) asserts that "analysts of environmental conflict do not systematically consider ways in which environmental scarcity or change can stimulate cooperation." Barnett (2000: 274) agrees, claiming that the majority of studies in this area have given the ontological priority to conflict over cooperation.

As enumerated above, however, critics overlook such aspects of environmental cooperation as relevant for the concept of security. In fact, it is precisely because regional and international stability may be advanced – if successful cooperation and regime creation resolve a particular environmental dispute – that a strong case may exist for linking environment and security (Brock 1992; Esty 1999). By some accounts such cooperation also advances trust among states, establishes cooperative habits, creates shared regional identities around shared resources, and establishes mutually recognized rights and expectations (Conca *et al.* 2005).

In conclusion, it is possible that, the more pressing environmental issues become, the less likely they are to be resolved. In line with Malthusian and realist thinking, such environmental issues may encourage some type of interstate conflict (Haas 1990: 38). Such conflict is also a function of the interdependence ascribed to states, given the sheer environmental resources they share, as they attempt to reduce their dependence on each other (Waltz 1979: 106, 154–5). However, it is just as plausible that the interdependence of states vis-à-vis a given environmental resource, combined with an urgency to act, motivates cooperation.

Whether it be harnessing a transboundary resource more efficiently or resolving a transboundary pollution problem, environmental interdependence creates a relationship in which neither riparian may act without some type of coordination with the other party.

Interstate coordination, as a result of scarcity and degradation, may in turn necessitate the establishment of international institutions and regimes so as to facilitate environmental cooperation. Analyzing institutionalized cooperation, in turn, necessitates an understanding of how such regimes evolve, including the factors that may inhibit or facilitate such coordination. In fact, it is in this context of regime formation, with the goal of environmental protection or resource allocation in mind, that a connection between the subfield of environmental security and the more general field of global environmental politics is highlighted.

#### *Scarcity, cooperation, and international bargaining*

If cooperation is to be considered an essential and equal counterpart to the conflict side of the environmental security coin, then several dimensions must be accounted for. First and foremost, further systematic investigation is needed into the conditions and levels/degrees of scarcity and degradation that may facilitate cooperation across various environmental resources (Dinar 2010). In reference to transboundary water issues, for example, such a research agenda has begun to take shape, with both theoretical (Wolf and Hamner 2000; Dinar 2009) and empirical works (Hamner 2009; Brochman and Hensel 2009; Tir and Ackerman 2009) exploring the effects of scarcity on interstate cooperation.

While scarcity and degradation may work to encourage interstate coordination, understanding the evolution of institutionalized cooperation also requires consideration of the development of regime formation. Although Chapter 1 of this book has gone into great detail discussing regime theory and global governance, several elements important for understanding environmental regime formation are highlighted here. In fact, one major factor that often complicates cooperation in the case of transboundary environmental resources is the asymmetric context in which states interact (Susskind 1994: 18–19). Understanding how these asymmetries, or differences among the parties, are overcome, either through bargaining strategy or treaty design (Young 1994: 128, 132–3; Raustiala and Victor 1998: 696), is thus likewise paramount for a more comprehensive understanding of environmental security. Two important asymmetries are mentioned below.

The first type of country asymmetry is the economic differences among the parties. Such differences likewise have ramifications for the way in which states consider the effects of pollution or environmental degradation, with poorer countries often prioritizing more pressing issues over environmental protection (Barkin and Shambaugh 1999a: 13; 1999b: 178). Environmental protection is also expensive to institute, and poorer countries do not necessarily have all the means to engage in, say, pollution abatement. To that extent, a regional or global regime that would potentially be devised for the sake of environmental stewardship may be affected, as one party may sense more urgency to deal with an environmental problem compared with another.

The case of ozone depletion, and the 1987 Montreal Protocol, is very instructive when considering economic asymmetries and cooperation. From a security perspective, the consequences of ozone depletion could be potentially grave and life threatening. A depleted ozone layer would essentially mean that more ultra-violet radiation would enter the Earth, resulting in more skin cancer cases, lower yields in agriculture, and an increase in smog. When the ozone regime was first conceived, richer and developed countries were relatively more eager and ready to conclude a regime over the abatement of chlorofluorocarbons (CFCs) – the main

chemical agents found to be depleting the ozone layer. Major developing countries, on the other hand, played a very minor role in the initial negotiations, largely because they did not see the benefits in cooperation relative to the costs of abatement they would have to incur (Barrett 2003: 346). Over time, however, it was becoming increasingly clear that, without the participation of large developing countries (and CFC producers and consumers) such as India and China, efforts by the developed world to reduce the effects of CFCs on the ozone layer would be inadequate in the long run. The bargaining strength of the developing world was thus affected. In 1990 the original protocol was amended to include a compensation clause incentivizing participation by developing countries. In this particular case, side payments (and technical assistance in the form of technology transfers) to developing countries offset the economic asymmetries that in turn challenged cooperation.

A second type of asymmetry pertains to the geographical location of the respective countries along the resource commons (Giordano 2003: 371–2). In the case of transboundary water or transboundary air pollution, this is quite apparent. Upstream or upwind states are often able to pollute, or simply to control the source (in the case of river water), while assuming fewer of the pollution costs, which are more often felt by downstream or downwind countries. If a poorer country is likewise located upstream, this could further exacerbate the problem, since the richer downstream or downwind state has a much lower tolerance for pollution.

The case of transboundary rivers, and specifically the Syr Darya and Amu Darya rivers in Central Asia, provides a very instructive lesson when assessing geographical asymmetry. From an environmental security standpoint, the Aral Sea Basin (in which the Syr Darya and Amu Darya are situated) not only supports 75 percent of Central Asia's population but contributes to the region's irrigated agriculture, particularly cotton production – the leading source of income for a number of those countries downstream, including Uzbekistan, Kazakhstan, and Turkmenistan. Hydropower, or the use of water for electricity production, provides another mode of economic development for upstream states such as Kyrgyzstan and Tajikistan. In general, the issue of water allocation and utilization has produced great political tensions in the region, which have escalated frequently into bellicose rhetoric and occasionally to military threats (Horsman 2001: 71–7). When these five republics gained independence from the Soviet Union in 1992, the problem of conflicting uses of water (cotton production versus hydropower generation) from the two rivers immediately surfaced and cooperation was inhibited. Given the underlying geographical and usage differences among the parties, a strategy that can best be described as 'issue linkage' was eventually sought as a means to offset the asymmetry. Thus, in return for timely releases of water in the spring and summer (the cotton-growing season), Kyrgyzstan would receive coal and natural gas in compensation for not being able to release these waters in the winter so as to generate hydroelectricity for its own energy needs. While this strategy of issue linkage in the context of the Aral Sea Basin is noteworthy (Weinthal 2002: 114; McKinney 2004: 199, 218), it is imperative to note that problems among the countries pertaining to conflicting uses of the two rivers have continued. Interestingly, some analysts have argued that the barter arrangements in place should be replaced with financial compensation or side payments from downstream states to upstream states to foster more efficient and stable cooperation (Mamatkanov 2008).

#### **Conclusion**

This chapter considered the history of the concept of environmental security and in that context provided some of the key arguments of the traditional and non-traditional schools

of security studies. In this framework, the debate between proponents and critics of the concept of environmental security was also highlighted. While this latter debate is entrenched in various philosophical differences and policy consequences of associating the terms "environment" and "security," the two camps of the debate seem to agree on the importance of cooperation in the context of environmental degradation and resource scarcity. In short, while one side considers the interstate violent conflict that can erupt over scarce resources and environmental change, it also reflects on the importance of international treaties and interstate coordination in resolving the property rights disputes that are the catalyst for such conflicts. The other side of the debate, on the other hand, criticizes the relationship between violent conflict and resource scarcity, pointing instead to the cooperative-inducing characteristics of scarcity and degradation. While some empirical studies have demonstrated that resource scarcity and environmental degradation are correlated in some fashion with interstate militarized affairs, more support exists for the claim that violent conflict between states over resource scarcity is the exception rather than the rule. Of course, this is not the case for conflicts of interest between states, which proliferate across a multitude of environmental issues. Yet, even in such non-violent cases, conflict often leads to cooperation, and interstate coordination may work to increase trust among countries and increase regional and international stability, broadly defined. In other words, resource scarcity and environmental change, and the consequent interdependencies such conditions magnify, motivate cooperation between states so as to deal with the respective environmental problem.

As this chapter further attests, cooperation as a result of resource scarcity and environmental degradation is an important part of the environmental security paradigm. However, with very few exceptions, this area of research has been largely understudied. As previous scholars have reiterated, cooperation is an important side of the environment and security coin, yet it is often overshadowed by studies on conflict and the environment. It is also important to recognize how additional factors play a role in motivating (or inhibiting) cooperation. In particular, understanding how country differences affect negotiations, and in turn influence cooperation, is further related to the study of environmental security. Moreover, examining which mechanisms can be employed (i.e. side payments, issue linkage, and other types of treaty design components) to encourage cooperation (in light of these asymmetries) is likewise relevant for a comprehensive discussion of environment and security.

Indeed, acknowledging and emphasizing the peace and cooperation side of the security coin (in addition to the conflict side) is crucial for a more comprehensive understanding and use of the concept of environmental security. Consequently, bringing the cooperative element to the fore may bridge the gap between those proponents of the environmental security concept and its critics. Perhaps most importantly, by considering the cooperation side of the resource scarcity and environmental degradation equation, we note how the subfield of environmental security is associated with the larger field of international environmental politics. Issues of environmental governance and regime formation are thereby intrinsic to the study of environmental security.

#### Notes

- 1 Another area of study not mentioned above is related to the analysis of intra-state warfare as a function of resource abundance (primary commodities) or the struggle to control resource rents (Collier 2000; de Soysa 2000).
- 2 The above three arenas to which I relegated the topic of environmental security can be considered as the more conventional issues. Other questions related to the concept of environmental security are greening the military, using military and intelligence assets to support environmental initiatives, and providing disaster and humanitarian assistance (Matthew 2000, 112–15).

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