Theorizing the Link Between Environmental Change and Security

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INTRODUCTION

The issue of environmental change (that is, of natural and human induced changes in the Earth’s environment, affecting land use and land cover, bio-diversity, atmospheric composition, and climate) raises questions of great importance for the international community. Some of the most intriguing questions relate to the way in which states should co-operate in order to mitigate, or adapt to, environmental change. Other questions relate to the way in which global environmental change may exacerbate existing inequalities within, or between, states. Still further, and seemingly more intractable, questions concern the legal and moral principles (such as the concept of sustainable development, the ‘polluter-pays’ principle, and the ‘precautionary’ principle) that might provide a context for the equitable inter-temporal distribution of environmental costs and benefits. The issue that will be addressed in this article, however, is the extent to which the issue of environmental change can be pursued within the rubric of either human or national security.

On the face of it, the prospect of securing a full reconciliation between the notions of environmental change and security are not encouraging. Consider Wolfers’ influential definition of security, according to which security ‘in an objective sense, measures the absence of threats to acquired values, in a subjective sense, the absence of fear that such values must be attacked’. It is true that this, and other similar definitions, are consistent with the notion of environmental security, that is, the view that there is a distinct class of threats which arise from environmental changes and stresses. However, the traditional focus of work on security has been on the investigation of military threats to the territorial integrity of a given state which arise either externally (from the military activities of other states) or internally (from the subversive, and generally violent, activities of terrorist groups). The security studies literature usually, though not exclusively, views individual states as sovereign entities which pursue their own advantage in a context where other states do the same. That is, this literature is on the whole shaped by neo-liberal and neo-realist assumptions, such as the assumption that the behaviour of states is determined by the structure of power relations in the international environment. The notion of security which flows from this view of state behaviour, as Dabelko and Dabelko have put it, holds that security equates to ‘the effort to protect a population and territory against organized force while advancing state interests through competitive behaviour’.

The problem is that it is not easy to see how any non-military phenomena, scarcely those arising from highly complex and unpredictable biological and physical systems associated with environmental change, might threaten a state’s security when security is viewed in this rather restricted sense. Traditional accounts of security during the cold war period held that the paradigmatic threat to national security was the capacity of another state to mount a decisive nuclear attack. This reflected the fact that cold war security theorists were preoccupied with the thought that a decisive strike against the people and institutions of any state could be translated from threat to reality in a matter of minutes. The consequence of this preoccupation was that the politics of nuclear confrontation, and nuclear weapons proliferation, became the key focus of security scholarship during this period. Threats to national security which did not have the special characteristics of nuclear attack – in short, immediacy and decisiveness – were neglected.

Several considerations have combined in recent years to undermine the view that security studies should be restricted to considering military threats, such as


2 It is worth mentioning that there are at least three accounts of the nature of environmental security. What we might refer to as Environmental Security, focuses on the way in which environmental stress causes violent conflict (and thereby insecurity); Environmental Security, focuses on the way in which violent conflict exacerbates environmental stress; and Environmental Security, encompasses both the way in which environmental stress causes violent conflict and the way in which violent conflict exacerbates environmental stress. The focus of this article is the first of these accounts.

nuclear attacks. Four of these considerations are particularly worth mentioning. First, the break up of the Soviet Union had the consequence that the threat of full scale nuclear confrontation between the superpowers receded. As the credibility of the paradigmatic threat to national security receded, many security scholars, and the security community in general, warmed to the idea that there might be non-military threats to national security. Second, awareness of the increasing interdependence of economic relations throughout the world, as manifested in a series of global economic and financial crises, has led to an awareness that destabilizing changes in economic variables in one part of the world can lead to significant levels of instability and insecurity in distant states. Third, increasing evidence has emerged that certain environmental changes could well endanger the existence of whole communities, as well as exacerbating already existing social evils such as poverty, mortality, morbidity, overpopulation and so on. This consideration has gained particular salience in the light of successive internationally authored reports on the scientific basis, and likely human impact, of global climate change. Fourth, not content with the security community’s partial adoption of the language of environmental threats to national security, a number of scholars have sought to defend the view that the most salient impact of environmental change is the way that it threatens human security. As I seek to show below, the notion of human security is problematic, but the point I want to make here is that proponents of the idea want to emphasize that the key threats which the international community will face in the future will often be to the security of the component parts of the state (individuals, families and sub-state communities) rather than the states themselves.

In the light of the considerations mentioned above, it might strike some as odd that the notion or concept of environmental security is at all controversial. However, the fact remains that the relation between environmental change and security provides the basis for much debate, as demonstrated by the large number of international research projects, articles and books which are devoted to it. In what follows I do not attempt to construct a new theory of environmental security, but rather to provide a conceptual overview which might bring into clearer focus the key issues on which contributors to this important debate differ. In the next section I discuss the claim that the concept of security should be extended (i) in order to cover non-military threats and (ii) in order to cover the security of non-state entities. In the section after this I outline a new typology of views on the connection between environmental change and security. Finally, in the last section, I discuss a methodological approach to issues of environmental security which might provide a context for further conceptual work on environmental security.

**COMPREHENSIVE AND DEMILITARIZED SECURITY**

**ENVIRONMENTAL STRESS, INSECURITY AND VIOLENT CONFLICT**

A well entrenched assumption in the security literature is that conflicts over natural resources are a perennial source of war. Some have gone further. Ullman, for example, has put forward the view that resource conflict is at the root of most violent conflicts in history. As well as investigating alleged past and present instances of resource driven conflicts, much of the literature on environmental security seeks to defend the claim that environmental stress is a major, and growing, cause of violent conflict and insecurity – particularly in the developing world. That this is a distinct claim to be defended, and criticized, independently of the resource-war issue, is evident in the fact that the origins of resource wars cannot always be traced to conflicts over transboundary environmental stresses (such as pollution, for example) but rather to conflicts which arise purely over the possession of scarce resources. This suggests that there may be two key understandings of environmental conflict, and thus environmental security. The first concerns the way in which conflicts over natural resources threaten to undermine the security of states. The second concerns the way in which degradations of the environment threaten to undermine the security of states, and possibly other entities. In what follows I adopt the second of these two understandings of environmental conflict/security. This is because I assume that this is the issue we are mostly concerned with.

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concerned about when discussing the link between environmental change and security.\(^9\)

Environmental change is often assumed to be a much more indirect cause of violent conflict than inter-state rivalry for precious resource ownership. According to Elliott, for example, to the extent that environmental change gives rise to violent conflict, it does this by ‘interacting with other social, economic, political and cultural drivers which (taken together) reduce instability in a given domain’.\(^10\) Moreover, according to the World Commission on Environment and Development, ‘poverty, injustice, environmental degradation, and conflict interact in complex and potent ways’.\(^11\) The sorts of socio-economic drivers which have attracted most interest in the literature concern the impact of growing environmental stress on demographic variables, such as mass migrations and refugee crises; economic variables such as total employment; and civil strife and unrest.\(^12\)

Perhaps the most sophisticated research on the link between environmental change and violent conflict has emerged from the work carried out at Toronto University by Thomas Homer-Dixon and associates. This research was, above all, motivated by a lack of satisfaction with the level of abstraction which permeated early debates on the re-conceptualization of security, which attempted to accommodate non-military threats into discussions of security on the basis of ‘anecdotal evidence of the importance of these threats. As Lonergan et al. have put it, the conceptual debates about the broadening of security had given rise to ‘a number of plausible hypotheses, but rigorous studies were lacking’.\(^13\) I think we can explain the frustration with the early conceptual debates about the extension of the concept of security with recourse to the idea of essential contestedness. The concept of security appears to be a clear example of a concept that is prone to endless, irresolvable dispute regarding its meaning and application. This is not because these disputes attract interpretations put forward in bad faith. As W. B. Gallie has argued, this is because disputes centred on concepts such as security ‘although not resolvable by argument of any kind, are nevertheless sustained by perfectly respectable arguments and evidence’.\(^14\) Put a different way, to say that a concept is essentially contested ‘is to contend that the universal criteria of reason, as we can now understand them, do not suffice to settle these contests definitively’.\(^15\) Take the disputes in security studies between the proponents of demilitarized, or non-statist, views of security and their critics. The idea is that, while these writers share the concept of security in the sense that they will agree in regarding a number of situations or practices as threats to security, in many other situations these writers might disagree over whether the concept of security applies.

In response to the irresolvable conflicts which come as an inevitable consequence of conceptual discussions of the meaning, value, scope and content of security, the strategy of Homer-Dixon and associates was to engage in a much more narrow, and empirically driven, focus on the way in which environmental stress gives rise, either directly or indirectly, to violent conflict in various parts of the world.\(^16\) These researchers identified several case studies which appeared to show a link between environmental change and violent conflict, and went on to investigate whether or not resource scarcities and environmental stresses are brought about by environmental changes.\(^17\) Four interim findings of this ongoing research are discussed by Homer-Dixon in detail. First, that the most important environmental changes are Causes of Acute Conflict’, International Security, 16(2), 76–116 (1991); V. Percival and T. Homer-Dixon, ‘Environmental Scarcity and Violent Conflict: The Case of South Africa’, Journal of Peace Research, 35(3), 1998, 297–8. The Homer-Dixon led Project on Environment, Population, and Security has an extensive WWW site at: <http://ult2.library.utoronto.ca/wwwjpcs/eps.htm>.

\(^9\) Of course, some environmental conflicts will involve elements of both of these understandings. Consider the case of fresh water supplies in the volatile Middle East region (see Norman Myers, ‘Environment and Security’, Foreign Policy, 74, Spring 1989, at 28ff; Thomas Homer-Dixon, ‘Environmental Scarcities and Violent Conflict: Evidence from Cases’, International Security, 19(1), Summer 1994, at 13–14; W. Scheumann, ‘Conflicts on the Euphrates: An Analysis of Water and Non-water Issues’, in W. Scheumann and M. Schiffer (eds), Water in the Middle East (Heidelberg, Springer-Verlag, 1998), at 113–34. At the heart of water-based conflicts in the Middle East is the fact that fifteen states in the region compete for fresh water supplies contained in three rivers: the Nile, Jordan, and Euphrates. The demand for fresh water in the region consistently threatens to outstrip its supply, with the result that hostility and violent conflicts over water resources are a constant cause for concern. Aside from this simple resource scarcity problem, though, there are other environmental factors which contribute to the volatility of the region’s international relations. For example, a number of Middle Eastern states have undertaken dam projects which, although their primary purpose is to facilitate greater irrigation in order to increase agricultural output, threaten to divert water away from neighbouring states.

\(^10\) Elliott, n.6 above, at 159.

\(^11\) World Commission on Environment and Development, n.7 above, at 291.

\(^12\) Elliott, n.6 above, at 159ff; World Commission on Environment and Development, n.7 above, at 291ff.

variables as far as environmental causes of violent conflict are concerned are land, forests, water and fish. They found, however, that undue attention has been placed hitherto on the potential of ozone depletion and global climate change to cause violent conflicts. Second, they found that there are three main sources of environmental stress: environmental change, population growth, and social inequality. Third, they found that these three sources of environmental resource scarcity interact with (and reinforce) each other. Fourth, they found that societies which are able to adapt to environmental stress are more likely to avoid significant turmoil and conflict than those which are not. Pulling these findings together, they found that there was 'substantial evidence' for the claim that environmental scarcity causes violent conflict. They argue that 'although more study is needed, the multiple effects of environmental scarcity, including large population movements and economic decline, appear likely to weaken sharply the capacity and legitimacy of the state in some poor countries'.

**ENVIRONMENTAL CHANGE, NATIONAL SECURITY, AND HUMAN SECURITY**

Accepting that environmental variables are factors in both resource conflicts and certain disputes either between people living in the same state, or between people living in different states, or between states as such, what is the exact nature of the connection between environmental change and security? Does the fact that environmental change leads indirectly to a certain amount of conflict within, and between, states mean that such changes are significant threats to national (or some other conception of) security? Are environmental changes the sorts of phenomena that can threaten security? It is my view that these questions do not simply reflect hypotheses that are raised by conceptual analyses of the general proposition that non-military threats can affect security – the answers we give to them will often depend on the coherence of such propositions. As a result, we have more reason to investigate the conceptual level debates about the scope of security discourse than Homer-Dixon and associates realize. In the remainder of this section I survey some of the seminal contributions to these debates.

A number of writers have defended the view that many things are threatening in security terms aside from military threats. These writers can be divided into two camps depending on the account they offer of the scope of security discourse. The first camp seeks to include non-military threats in the discussion of security, but only insofar as these threats undermine the security of states; the second camp seeks to include non-military threats in discussion of security insofar as these threats undermine the security of both states and certain other entities. The key difference between the camps, then, is that members of the former camp retain the traditional rubric of national security, whereas members of the latter embrace the more radical rubric of human security.

An early, and influential, example of first camp thinking is to be found in the work of Richard Ullman. He argues that defining national security merely (or even primarily) in military terms conveys a profoundly false image of reality. That false image is doubly misleading and therefore doubly dangerous. First, it causes states to concentrate on military threats and to ignore other and perhaps even more harmful dangers. Thus it reduces their security. And second, it contributes to a pervasive militarization of international relations that in the long run can only increase global insecurity.

Ullman goes on to propose a broader definition of security according to which a threat to national security is an action or sequence of events that (1) threatens drastically and over a relatively brief spell of time to degrade the quality of life for the inhabitants of a state, or (2) threatens significantly to narrow the range of policy choices available to the government of a state or to private, nongovernmental entities (persons, groups, corporations) within the state.

One problem for demilitarized views of security, such as Ullman’s, is that instances of organized violence and environmental degradation quite often pose very different sorts of threats to human communities. Environmental problems such as climate change, ozone depletion, deforestation and so forth undoubtedly contribute massively to mortality and morbidity rates throughout the world, but to say that in so doing they undermine the security of the states where they hit hardest in the same way as wars and other violent conflicts seems problematic. The problem is that labelling anything that causes a decline in human well-being as a security threat may result in the term losing ‘any analytical usefulness’, as Deudney has put it.

Suppose that wars and environmental stresses gave rise to an identical incidence of morbidity and mortality in

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18 Ibid, at 8.
19 Ibid, at 8–16.
21 Ibid, at 25.


22 Ullman, n.7 above, at 129.
23 Ullman, n.7 above, at 133.
a given state in a given year. Would they pose equally prominent threats to national security? There are at least three reasons to think that they would not. First, at the heart of the traditional literature on security is the plausible, though largely unexamined, assumption that there is an important intentional aspect to the sorts of threats which undermine a state’s security. Wars between states seem to have an inherent intentional aspect, at least on the side of the aggressor, whereas the environmental changes which appear to bring about insecurity are more often than not either (i) the unintended, and unwelcome, by-products of human action, (ii) the products of natural forces, or (iii) some combination of (i) and (ii). Take the issue of global climate change. It is true that many scientists believe that human action is responsible for at least some of the climatic changes which they have detected in recent decades. However, no one seriously believes that people intentionally set out to increase greenhouse gas (GHG) concentrations in the atmosphere for the hell of it. Rather we believe that, to the extent that human actions are responsible for increasing concentrations of GHGs, this is an unfortunate side-effect of other intentional action (for example, the widespread use of vehicles with petrol engines). To the extent that we think an environmental change, X, has to have been brought about intentionally for it to threaten an agent’s, Y’s, security we will not view many of the climatic changes projected by the Intergovernmental Panel on Climate Change as threatening to Y in security terms (though of course, this is not to say that we cannot claim that such changes harm, or worsen, the condition of that agent in some way that does not connect to questions of security).

Second, environmental threats, and threats of violence, have very different sources and impacts. No one state is responsible for the majority of the anthropogenic GHG emissions which, it is alleged, drive global climatic change, and no single state is the sole recipient of the predominantly bad effects of climatic change. Rather, the causes and effects, costs and benefits, of climate change (as well as many other environmental changes) cannot be entirely explained in terms of national states. The causes and effects of organized violence, however, are much more readily investigated through the lens of the state and its security.

Third, the traditional focus of security studies has been on violent conflict of a particular kind, namely, violence directed towards State A from State B. As both Weaver and Deudney have observed, this ‘insider vs. outsider’ thinking is deeply ingrained in the security studies literature. According to the traditional view, a threat of violence must have at least some external dimension to be a credible threat to national security; this is true even of threats which emanate from individuals and groups within the state, who are generally regarded as being ‘outsiders’ or ‘the enemy within’. The proponents of demilitarized, or non-statist, conceptions of security often point to examples of environmental stress giving rise to civil, political and economic discontent and violence in various regions. In the vast majority of cases, these stresses have emerged as a result of the behaviour of both the government and the population of those regions. But, in this case, where does the external aspect of such threats arise from? As Deudney writes: ‘existing groups of opponents in world politics do not match the causal lines of environmental degradation’.

Let us now turn to the second camp of thinking on the scope of security discourse. An influential source of this thinking is research being carried out under the auspices of the Global Environmental Change and Human Security (GECHS) project. According to GECHS, human security is achieved when and where individuals and communities have the options necessary to end, mitigate, or adapt to threats to their human, environmental, and social rights; and have the capacity and freedom to exercise these options and actively participate in attaining these options.

A similar view is also held by Myers, who argues that:

One question that both the Myers and the GECHS conceptions of human security raise is whether human security can obtain in the context of states that either do not have fully entrenched basic welfare systems to guarantee some level of economic equality, or do not guarantee their citizens political rights to guarantee equality of democratic citizenship. This is because these rather ‘thick’ definitions of human security incorporate fairly sophisticated notions of human autonomy and

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25 Waever, n.24 above, at 63; Deudney, n.24 above, at 24.
27 Waever, n.24 above, at 63; Deudney, n.24 above, at 24.
28 Deudney, Ibid.
29 GECHS is an international interdisciplinary research project designed to advance research and policy efforts in the area of human security and global environmental change. It has an extensive WWW site at <http://www.gechs.org>.
30 Steve Lonergan et al., GECHS Science Plan (Bonn, International Human Dimensions Programme (IHDP), June 1999), at 29.
well-being, the implication being that we cannot discuss the security or insecurity of entities without considering the question of whether these entities operate in conditions conducive to their autonomy or overall well-being. The GECHS definition, for example, assumes that democracy is a necessary condition of security, and in doing so it plays down the importance of geological, demographic, ethnic and historical factors which influence the political and socio-economic significance of environmental events. These factors are at the very least partly independent of the political system they relate to, and would seem far more relevant to the issue of environmental insecurity than issues of democracy or autonomy. Consider the example of climate change. The Intergovernmental Panel on Climate Change (IPCC) suggest that the developed countries will be in a much better position to adapt to (and mitigate certain aspects of) climate change than developing states. However, much of the final distribution of the insecurities brought about by climate change will be shaped by non-political variables, such as geographical and demographic variables. It is not the Bangladeshi state’s perennial problems guaranteeing its citizens equal political rights and freedoms that may bring about its destruction in the light of rising sea-levels, but rather the fact that much of its population and industry is located along its low-lying coast.

The highly moralized understandings of security defended by GECHS and Myers raise at least two further problems. First, they raise the question of the link between the concept of security and the value of security. Most discussions of security attempt to keep these two issues apart, and claim that insightful judgements can be made about the extent to which an entity, such as the state, is secure without taking a stand on the issue of whether this security is ethically valuable. These accounts are ‘thin’ in the sense that they seek only to put forward an account of the necessary and sufficient conditions of a certain entity being secure from external or internal threats, rather than a moralized account of the higher ethical purpose which security might serve. Second, they run up against the consideration that many states, groups or individuals seem to maintain a fairly high degree of security in the absence of at least some social and political freedom. This seems a fair reflection of the situation of the Soviet Union in the cold war period, for example; and it might also be a fair reflection of the situation that the Chinese enjoy at present. Are we to say that individuals living in an economically, and militarily, secure society are insecure if the only reason we can come up with to explain this is that the conditions of democracy and autonomy are not protected in that society? Is it really the case that individuals or communities which operate within a non-democratic context should always be viewed as less secure than those individuals or communities which are fortunate enough to exist within the context of social or liberal democracy? Third, to have any point of contact with the common-sense notion of security, as well as avoiding being subsumed into the concept of well-being, human security must be restricted to a few basic conditions which enable individuals, and communities, to pursue the values which they affirm (whatever they may be). As some of these values might not be consistent with the ideal of autonomy, or indeed equality of democratic citizenship, we cannot build these predominantly liberal values into the definition of human security. In effect, the problem is that the Myers-GECHS view fails to keep apart the meaning of security and the value of security.

TOWARDS A TYPOLOGY OF ENVIRONMENTAL SECURITY

There are three key aspects of the debate between proponents of the national security and human security paradigms (and their offshoots) regarding the extension of the concept of security. These are brought into focus when three questions are posed:

- what is the nature of the entity whose security matters from the point of view of security discourse? (the scope question).
- from what phenomena is such an entity at risk of being rendered insecure? (the content question).
- Is environmental change a threat to the subjects of security discourse? (the environment question).

In essence, the response of Ullman and other proponents of what I will call the (narrow) comprehensive view of national security is that while we do not need to revise the traditional view’s insistence that it is the state which is the subject of security discourse, we do need to revise the traditional view’s insistence that it is only external military threats to (and the domestic order of) the state that mark out the appropriate objects of security discourse. That is, these writers answer ‘state’ in response to the first question; and ‘military and non-military threats’ in response to the second question. If these writers also view environmental changes and stresses as bona fide non-military threats to a sta-

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23 The IPCC suggest that countries which possess a ‘diversified industrial economy and an educated and flexible labour force’ will suffer least from the economic affects of climate change, whereas countries which possess specialized, and natural resource-based, economies and ‘a poorly developed and land-tied labour force’ will be expected to fare much worse. See J.P. Bruce, H. Lee, and E.F. Haites (eds), Climate Change 1995: Economic and Social Dimensions of Climate Change (Cambridge, Cambridge University Press, 1996), at 11.

24 According to one study, a 1 metre sea-level rise on the Bay of Bengal coastline would bring about a loss of up to 15% of the total land surface area of the country (on the assumption that coastal protection measures are not established). See A.J. McMichael, A. Haines, R. Slooff and S. Kovats (eds), Climate Change and Human Health (Geneva, World Health Organization, 1996), at 156.
te’s security I will refer to them as proponents of *environmental national security*.

In essence, the response of Myers and other proponents of what I will call the (wide) comprehensive view of human security is that we need to drop both the claim that it is the state which is the sole subject of security discourse and the claim that it is only military threats to states that are the appropriate objects of security discourse. That is, these writers answer ‘state or other relevant entity’ in response to the first question; and ‘military and non-military threats’ in response to the second question. If these writers also view environmental changes and stresses as *bona fide* non-military threats to a state’s security I will refer to them as proponents of *environmental human security*.

(i) The scope of security.

See figure 1. There are a number of entities, other than the national state, which might be the subjects of security discourse. For example, a key necessary condition of an entity being the *prima facie* subject of security or insecurity is that alternative developments in the world at large render that entity more or less insecure. Consider once again Wolfers’ influential definition of security, according to which security ‘in an objective sense, measures the absence of threats to acquired values, in a subjective sense, the absence of fear that such values must be attacked’.34 Several entities other than the state would seem to pass this test, the most obvious of these being individual human beings, sub-statal groups (such as ethnic or linguistic minorities), supra-national organizations (such as the EU), and perhaps the Earth’s population considered as a whole. Moreover, if we were to embrace either a *zoocentric* or *ecocentric* (as opposed to the standard *anthropocentric*) approach to security we might go on to suggest more radical suggestions for the subjects of security studies, such as the biosphere itself or other animal species.35

It is true that some scholars appear to rule out the possibility of extending the scope of security by assuming that the only coherent and useful understanding of security is that of *national* security. But this assumption is rarely examined. In an otherwise illuminating discussion of the problems of defining both environment and security, for example, Levy fails to consider definitions of anything other than national security.36 This might not be such a defect if he at any stage provided an argument for why the scope of security studies should be restricted to national states only, but he does not do so. A similar objection can be made to Deudney’s work. Deudney shares Levy’s scepticism of the notion of environmental security, and outlines several dissimilarities between traditional security threats and the environmental security threats outlined by proponents of demilitarized, or non state-centric, conceptions of security such as Myers.37 However, these dissimilarities themselves rest on an understanding of security discourse as being concerned essentially with *national security* and threats of *organizational violence*.38

(ii) The content of security.

See figure 1. According to proponents of *comprehensive security*, the notion of security should be amended to incorporate a sensitivity to various non-military threats to national security. The threats which the comprehensive conception seeks to introduce into security debates will usually arise out of circumstances which endanger certain entrenched societal values or goals, but where the values concerned are not themselves threatened as a result of organized violence, but rather as a result of some alternative cultural, social, environmental or political process. However, these threats might be conceived of as threatening values which underpin either human or national security (or both). Among the multitude of national security-affecting values which are discussed in the literature are the following: respect for individual/collective human rights and norms of justice; income, wealth generation and international competitiveness; population control; respect for cultural diversity; gender related inequalities; health; respect for law and order; and, of course, environmental change.

(iii) Environment and security.

We have already looked in detail at some of the arguments in favour of extending security discourse to include within its remit environmental threats. Suffice it to say that the typology put forward in figure 1 makes a crucial distinction between versions of comprehensive security which embrace environmental threats to security which can be distinguished between those that are state-centric (I call these *environmental national security views*) and those that are not (I call these *environmental human security views*).

SEEKING REFLECTIVE EQUILIBRIUM IN DISCUSSIONS OF ENVIRONMENTAL SECURITY

In this concluding section I want to defend the view that a fruitful way of investigating the link between

36 Levy, n. 16 above.
37 Ibid, at 23.
38 Deudney, n. 24 above, at 23–4.
39 Ibid, at 20ff.
34 According to an elegant typology provided by Brian Barry, *anthropocentric theories* are those which attribute value only to states of human beings; *zoocentric theories* attribute value only to states of sentient creatures, including human beings; and *ecocentric theories* hold that components of the natural world such as plant life, and possibly the biotic community as a whole, possess value independently of humans or animals. See Brian Barry, *Justice as Impartiality* (Oxford, Oxford University Press, 1995), at 20ff.
35 Deudney, n. 24 above, at 23–4.
environmental change and security is to adopt the methodological strategy of seeking a balance between empirical data about the conflicts which environmental change brings about and theoretical insights into (environmental) security. According to this view, a cogent theory of national security (as in the case of other political concepts such as social justice or democracy) must cohere with at least some of our most deeply held convictions about (environmental) security and other empirical evidence that bears on this matter. This is not to say, however, that this methodological strategy requires us to evaluate the theories considered solely according to the extent to which they reflect empirical work on the conflictual outcomes caused by environmental change. However, it does mean that we seek to take empirical data seriously in our investigation of the concept of security.

There are a number of ways in which this ‘coherentist’ approach might be developed, but perhaps the most obvious is captured by the notion of reflective equilibrium. The notion of reflective equilibrium was introduced by Rawls.39 In A Theory of Justice, Rawls

addresses the issue of how we might best characterize the relation between our common-sense beliefs and our ethical or political theories. Do the former stand in need of the latter for their justification? Or is the acceptability of these beliefs constrained by considerations of theory? Or is the justifiability of ethics constrained in some way by our considered common-sense beliefs? Rawls suggests that, rather than privileging either side of the equation, we should endeavour to find a balance, or equilibrium, between pre-theoretical and theoretical ethical beliefs. The basic procedure for doing this is as follows. First, we start with our most considered pre-theoretical beliefs about a political or ethical issue purged of basic inconsistencies. Second, we attempt to construct a theory that will explain and give unity to these beliefs. Third, we ask whether this theory implies that we ought to change or modify some of our pre-theoretical beliefs. Fourth, and depending on our answer to this question, we have basically two options: (a) to return to theory and adjust it until it delivers acceptable results, or (b) to give up some elements of the pre-theoretical position. Whether we choose (a) or (b), Rawls thinks, depends on the circumstances of the case. If the theory is particularly attractive, and any modifications to it appear arbitrary, then we may decide to reject the common-sense beliefs which we started with (an approach which we might refer to as ‘biting the bullet’). This is an attractive move if we can give a good explanation of why the common-sense view is obviously unsound which is independent of the theory we give. If, however, the common-sense view is very firmly held, then we might wish to modify the theory. Basically, the overall aim is to reach a point at which we are, on balance, satisfied: where we have reached a ‘reflective equilibrium’ between common-sense beliefs about particular practices and our best candidate political or ethical theory.

Of course, the raw data we will be appealing to in the context of (environmental) security debates will be empirical research on the link between environmental change and violent conflict, or co-operation, rather than the pre-theoretical beliefs people have about the nature of security (although these may prove relevant at some point in the procedure). Nonetheless, the method of reflective equilibrium appears well suited to issues of environmental security for, as Homer-Dixon and associates have demonstrated, there is much empirical data that can be collected and which is relevant to the link between environmental change and alternative understandings of security. This empirical research has addressed the issue of the socio-economic and socio-political impacts of international resource conflicts and transboundary environmental problems, and as a result contrasting theories of the environment-security link can at least in principle be tested against the results of this research. This does not, of course, imply that the findings of these empirical projects should be viewed uncritically, for the nature of reflective equilibrium as an approach to political and ethical issues is that of seeking a balance between the importance of gathering raw data which has a bearing on the matters at hand and the fact that these findings will need to be constantly interpreted in the light of fresh theoretical insights, as well as fresh empirical findings. However, it does suggest that an approach to security issues which takes empirical research seriously will have a rich source of empirical data to draw upon.

One interesting application of the reflective equilibrium approach in this context is that it seems to undermine recent taxonomies of environmental security which refer to the existence of three distinct ‘generations’ or ‘waves’ of work on the link between environment and security, such as those proposed by Ronnfeldt and Levy.40 According to Ronnfeldt, for example, the first generation of environmental security research ‘refers to an ongoing interdisciplinary debate in the academic and political community on whether and how environmental issues should be incorporated into security concerns’; the second generation refers to the attempt to ‘deviate from the conceptual polemic and to base research on firm empirical ground’; and the third generation refers to the attempt to place environment and security research on firmer methodological ground.41 The flaw in such typologies, though, is that they do not take adequate account of the fact that the different approaches to environmental security referred to do not come in and out of existence (and more to the point, they do not come in and out of relevance) in any linear fashion. Rather, a real grasp of the issues surrounding the security-environment debate requires constant reciprocal interaction between them. For this reason I prefer to view the categories described by Ronnfeldt as ‘levels’ of environmental security thinking – though with the rider that I am not convinced either that there really exists a ‘third level’ of discourse which is independent of the first and second levels.

There is another interesting application of the reflective equilibrium idea which I want to raise. As I have explained above, this methodological approach stresses the importance of both empirical studies of environmental conflict and theoretical conceptual work on the nature and scope of security discourse. No one side is privileged over the other: the method requires bringing both of these approaches into coherence with each other, not maintaining the priority of one over the other. One way of putting this is to observe that it is the conceptual work of theorists that gives rise to hypotheses which empirical research can test; and it is the empirical findings of this empirical research which will often, though not always, result in a particular con-

41 Ronnfeldt, n.40 above, at 473, 475, 480.
ceptual view being amended. The empirical work of Homer-Dixon and associates has, for example, given theorists much food for thought. For example, it seems to put a certain amount of pressure on defenders of traditional militarized conceptions of security to reformulate their views. As we have seen, however, the research on environmental stress and violent conflict conducted by Homer-Dixon and associates is to a certain extent flawed. The main problem with it is the lack of any control group associated with their case study analyses; they are looking for links between environmental variables and violent conflicts only in cases where conflicts have already emerged. If we are to make a serious attempt at pursuing a reflective equilibrium between environmental security theory and environmental security practice, we really need a fresh impetus on the empirical side.

Aside from recommending more research that involves variability across both the independent variable (environmental change) and the dependent variable (violent conflict), what else might we suggest? It is my view that the next breakthrough in environmental security research will be achieved by seeking, and developing, linkages between research on environmental causes of violent conflict and research on the emergence of co-operative solutions to environmental resource dilemmas, such as those surrounding the issue of Common Pool Resources. According to the seminal definition proposed by Elinor Ostrom, Common Pool Resources (CPRs) are ‘natural and human-constructed resources in which (i) exclusion of beneficiaries through physical and institutional means is especially costly, and (ii) exploitation by one user reduces availability for others’. CPR resource systems are particularly prone to dilemmas in which people acting within the paradigm of unconstrained self-interest become trapped in a set of behaviours that lead to the overuse, and eventual destruction, of the resources they depend upon. This is because instrumentally rational agents faced with a finite resource which is open to all will over-exploit this resource as a result of the fact that each receives the benefits of his own actions, while only bearing a share of the costs resulting from the resource’s overexploitation. Typical CPR systems would be constructed around agricultural land or marine ecosystems.

According to early work on CPRs, pioneered by Garrett Hardin, the potential tragedy of overuse and destruction of common resources could only be avoided by two developments: either (1) the resources must be taken into private ownership, or (2) the state must take over ownership and control of the resources. At the heart of Ostrom’s approach, however, is the thought that Hardin’s ‘tragedy of the commons’ model is not inescapable. Rather, it is her view that in a number of cases CPR dilemmas can be solved, though this depends on certain preconditions obtaining. The most important of these conditions concerns the emergence of reciprocity and trust between those who operate within any given CPR system. In cases where norms of reciprocity and trust cannot emerge, such as in contexts where there is little communication between those who operate within the system, Ostrom concedes that Hardin’s ‘tragedy of the commons’ will continue to apply. At the time of writing, however, it is worth noting that there is a large, and ever expanding, database of documented cases of CPR systems that are managed efficiently in the absence of either privatization or socialism.

What has this got to do with environmental security? It is my view that successful CPR systems offer an important bulwark against the environmental insecurity of the individuals and groups that participate in them. By reducing conflict within the state, they may also, indirectly, increase the security of the state itself. As Ostrom observes, ‘protecting institutional diversity related to how diverse peoples cope with CPRs may be as important for our long-run survival as the protection of biological diversity’. The other side of the coin is that CPR systems are peculiarly vulnerable to the effects of civil and international wars. The question arises whether successful strategies for CPRs can also be used by states to reduce international environmental conflicts, such as those associated with the much discussed case of fresh-water supplies or those which are expected to arise as a result of future climate change.

One consideration which bears on this issue is that there is some evidence that governmental attempts to create successful CPR systems hinder, rather than facilitate, the emergence of local co-operation. This suggests not only that state intervention may not be the ideal vehicle for the development of successful CPR systems in intranational contexts, but also that CPR solutions may not be applicable to environmental resource dilemmas at the international level. The research of Ostrom and others has identified literally thousands of cases where CPRs are managed effectively, but these are almost all to be found at the local and regional levels. Part of the reason for this is that

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44 To get an idea of the tremendous amount of research in this area, see the WWW site for the International Association for the Study of Common Property (IASC): <http://www.indiana.edu/~iascp>.

45 Ostrom et al, n.42 above, at 282.

46 Ibid, at 281.
norms of trust and reciprocity emerge more readily among those who live in the same locality. But, as Ostrom observes, it is also because the greater the population associated with a CPR the more difficult it is for rules of organization, and enforcement, to emerge.\textsuperscript{47} The upshot of such considerations might seem to be that research into CPR systems and solutions is of limited relevance to issues of national environmental security, or indeed to issues pertaining to the management of global environmental changes such as those associated with climatic change, biodiversity, atmospheric composition and so forth (Ostrom refers to this as the ‘scaling-up problem’).\textsuperscript{48} However, it might be that future collaborative research between these related, but distinct, approaches to environmental issues will provide a common approach to both national insecurity and CPR dilemmas.

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\textsuperscript{47} Ibid.
\textsuperscript{48} Ibid.