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Environmental security

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Introduction

Every so often a new phrase enters the lexicon of international relations. ''Environmental security'' is one such phrase. As a normative concept, it illuminates debates about what security means in a post–Cold War world – security for whom and from what – and about the kinds of strategies and policies that will ensure that security. To paraphrase Norman Myers, what will ''buy more security – real, enduring and all-round security.''[1] This chapter considers environmental security in the context of debates about the relationship between traditional security and human security. It begins by examining environmental degradation as a component of human security. It then explores how, if at all, environmental concerns might integrate traditional security approaches and strategies with those more applicable to the human security agenda. The final section examines some of these themes in the context of environmental degradation in Pacific Asia.

Human security

In its 1994 *Human Development Report*, the United Nations Development Programme (UNDP) elaborated a clear and sophisticated understanding of human security and its component parts. Human security, the

UNDP argued, is universal, interdependent, and people centred, best achieved through early prevention rather than later intervention. Rather than a concern with weapons or with territory, "it is a concern with human life and dignity."[2] Human security is, however, more than security reduced to the level of the individual or an emphasis on "the individual's welfare."[3] It is conceptually and practically interwoven with global security. As Canadian Foreign Minister Lloyd Axworthy observes, human security "acknowledges that sustained economic development, human rights and fundamental freedoms, the rule of law, good governance, sustainable development and social equity *are as important to global peace* as arms control and disarmament."[4]

The relationship between human security and traditional security is therefore embedded in complexity. It provides an opportunity to recognize different kinds of threats, not to states but to peoples and communities, and to reassess the probability of insecurities. The Commission on Global Governance observed, for example, that "threats to the earth's life support systems, extreme economic deprivation, the proliferation of conventional small arms, the terrorising of civilian populations by domestic factions and gross violations of human rights ... challenge the security of people far more than the threat of external aggression."[5] These are, as Ken Booth suggests, "problems of profound significnce"[6] and ones that place "emancipation at the centre of new security thinking."[7] The UNDP also anticipated human security as an antidote to more traditional security emphases, which Walt summarizes as "the threat, use and control of military force"[8] and the "likelihood and character of war."[9] Its 1994 Report argued that "for too long the concept of security has been shaped by the potential for conflict between states ... equated with ... threats to a country's borders."[10] Human security, the UNDP suggested, invoked a "profound transition in thinking."[11] How, then, does environmental security fit within this transition?

Environmental security: Securing the environment

Protection of the environment is crucial to human security. It is a decisive factor in economic vitality. A secure environment is fundamental to individual and community health and well-being and, in some cases, to survival (the ultimate security challenge). It is, if nothing else, "the essential support system on which all other human enterprises depend."[12] As Gareth Porter explains, "increasing stresses on the earth's life support systems and renewable natural resources have profound implications for human health and welfare that are at least as serious as traditional military threats."[13] The UNDP also made it quite clear that equitable access

to resources and environmental services was a central component of human security. Protection of the environment – environmental security – is important also because it is a fundamental ethical principle that the environment should be protected and sustained, not abused and degraded. Yet, as Gwyn Prins reminds us, environmental security is a goal. What we have, he argues, is environmental insecurity.[14]

The nexus between human security and protection of the environment has been acknowledged as a fundamental international principle. Principle 1 of the Rio Declaration – the statement of principles adopted at the 1992 United Nations Conference on Environment and Development (UNCED, or the Rio Summit) – states that ''human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.'' The irony is, of course, that human activity is the cause of environmental insecurity. In other words, the human security dilemma is that the causes of human insecurities are located in the practices of human economy and society as well as the structures that inform and constitute those practices.

It is clear that human activity is changing the environment – and not for the better – in a way unlike that of any other era.[15] Extensive and excessive resource use, energy-inefficient lifestyles, industrialization, and the pursuit of economic growth are inextricably linked to environmental degradation, within and across state borders. The agenda of contemporary environmental concerns and their social, economic, and ecological impacts is a long one. It includes atmospheric pollution, ozone depletion, and climate change; deforestation, desertification, and land degradation; loss of biodiversity, species, and habitat; air and water pollution; the impacts of urbanization and industrialization, including the increased production of toxic and hazardous waste; depletion of non-renewable and renewable resources, including water and arable land. Air pollution, water pollution, marine pollution, depletion of fish stocks, and loss of arable land all contribute to health insecurities, food insecurities, and economic insecurities – in other words, to human insecurities. Poor environmental practice exacerbates disasters of nature such as floods and landslides. These, in turn, increase human insecurity.

There is also a fundamental inequity in the environmental and human insecurity problem. The industrialized world accounts for about one-quarter of the world's population. Yet it consumes about three-quarters of the world's energy and resources, and produces a similar proportion of the world's waste and pollution.[16] The social and economic consequences of environmental degradation and resource depletion will, on the other hand, more quickly exacerbate the already-existing misery and despair in the poorer parts of the world. The most immediate and disproportionate impact of environmental degradation will be felt by those who are

already marginalized in society and who have contributed less to environmental decline – the poor, women, and indigenous peoples for example. Up to 1 billion people could be displaced or made further insecure as a result of inundation of coastal regions through climate-change-induced sea-level rises, through changes in agricultural zones and loss of croplands, or because low-lying island countries simply cease to exist. The loss of forests (along with the practices that contribute to deforestation) threatens loss of habitat and subsistence to millions of forest dwellers and indigenous peoples as well as increasing the vulnerability of poor peasants to land-clearance schemes and development programmes. Up to 1.2 billion of the world's people are threatened by the impacts of desertification.[17]

Thousands of committed people have worked hard to keep environmental issues on the international agenda since the 1992 Rio Summit. Negotiation and debate on environmental issues have continued apace. Within the UN system and outside it, any number of committees, working groups, expert panels, subsidiary bodies, and commissions, convened by governments, intergovernmental agencies, scientific bodies, and non-governmental organizations, have continued to focus on expanding our understanding of environmental problems and on the search for solutions. Much has also been made in those years of the imperative for a global partnership (as Agenda 21 has it) in support of our common future (as the World Commission on Environment and Development described it). As the President of the Republic of the Maldives reminded the industrialized countries in a speech in 1995, ''environmental security is a common good that we share together or forfeit forever.''[18]

Yet despite the many thousands of words on paper – in conventions, protocols, declarations, communiqués, statements of principle, management programmes and action plans – and despite some local successes, environmental degradation continues to worsen. The United Nations Environment Programme's (UNEP) first *Global Environmental Outlook*, prepared for the 1997 General Assembly Special Session to Review the Implementation of Agenda 21 (the programme for action adopted at UNCED), states unequivocally that ''from a global perspective the environment has continued to degrade during the past decade ... progress towards a sustainable future is just too slow.''[19] The political will is lacking; the funds are not forthcoming; economic goals take precedence over environmental ones. There has been much activity but not enough action and the prognosis for environmental security, and the human security to which it makes a fundamental contribution, is not good.

Overcoming the global environmental crisis in the interests of the environment and human security requires new and invigorated forms of governance informed by the imperatives for cooperation and involving

not only states and governments but a strengthened civil society. It requires new norms and values, ones that emphasize interdependence, precaution and prevention, intra- and inter-generational equity, and the pursuit of local and global environmental justice. These are the values that the UNDP suggests are crucial to human security. But it is not clear that they have found much place in the pursuit of traditional security. Indeed, in many cases, it is precisely these values that have been undermined by such an agenda.

This brings us to the second theme of this analysis – the relevance of environmental security to the project of reconciling human and traditional security (if, indeed, such reconciliation is possible) and whether or not the intellectual and policy tools of the traditional security agenda are amenable to securing the environment.

Environment and security: Accommodation or subversion?

The environmental nexus between traditional and human security (or insecurity) has been acknowledged in international law. Principle 24 of the 1992 Rio Declaration states that warfare is inherently destructive of the environment; Principle 25 observes that ''peace, development and environmental protection are interdependent and indivisible''; and Principle 26 requires that states should solve their environmental disputes peacefully. Environmental concerns have been accommodated within traditional security circles, although not always welcomed by its most conservative proponents. But this has been done in a way that, despite some interesting conceptual and operational advances, does little to address the real problems of environmental insecurity or human security. It is not clear that ''environmental security,'' in the way it has been captured by the traditional agenda, meets the common security test outlined by proponents of human security. For this reason, a human security approach to environmental degradation (and environmental security) may serve more as a challenge to the normative assumptions and the policy prescriptions of the traditional security agenda.

In traditional security circles, environmental security brings environmental degradation within the more traditional framework of security geopolitics. It stands as shorthand for the likelihood for ''major environmental changes to generate and intensify conflict between and within states.''[20] This version of the environmental security project seeks to understand better the dynamics of this relationship and to identify the kinds of environmental degradation that might disrupt national, regional, or even international security, and how they might do so.

Much attention is paid to conflict or tension over scarce (or potentially

scarce) resources, particularly water and arable land and the environmental services they support. Freshwater is a fragile and finite resource: it constitutes only about 2.5 per cent of the world's water resources and even less than that is available for human use.[21] Global demand for freshwater is increasing as the world's per capita water supply continues to decline, from 17,000 m^3 in 1950 to 7,000 in 1997.[22] By the end of the 1980s, 80 countries with over 40 per cent of the world's population were facing water scarcities, along with the environmental and human insecurities that result. Water, and especially clean water, is fundamental to life: without it people die. The inter-state dimensions of water insecurity are highlighted by the extent of shared (that is, transboundary) water resources. Over 150 major river systems are shared by two countries and a further 50 are shared by between three and twelve countries. Per capita arable land is also on the decline. Contributing factors include population pressures, land degradation and desertification, the impact of urbanization, and the technological and biophysical limits of irrigation. The decline in available land for agriculture is unevenly distributed, with developing countries, particularly in Asia and Africa, suffering a disproportionate loss.[23] While the possibility of intra- and inter-state tensions and conflict over land resources features in the environmental conflict literature, immediate human insecurities are central to these concerns. These include loss of food productivity, increased malnutrition and related health problems, and involuntary movement of peoples.

The web of causality between environmental degradation and conflict is further complicated by what the World Commission on Environment and Development called "differences in environmental endowment"[24] – inequities in the distribution and use of resources, in the causes of environmental degradation, and in vulnerabilities to environmental change. "All too often," Myers argues, "the result is civil turmoil and outright violence, either within a country or with neighbouring countries."[25] Environmental scarcity is further linked to "population movement, economic decline and the weakening of states," and expected to exacerbate the potential for violence, disrupt "legitimised and authoritative social relations,"[26] and have "serious repercussions for the security interests of both the developed and the developing worlds."[27] As the UN Secretary-General's *Agenda for Peace* suggested, ecological damage becomes a new risk for stability.[28]

This particular environmental security narrative has been incorporated into more traditional security doctrine at national, regional, and international levels in which environmental degradation is labelled a "non-military threat." In this "renaissance" version of security, "new issues and challenges are being subsumed under old ... approaches."[29] The US government's National Security Strategy recognizes that the "stress from

environmental challenges is … contributing to political conflict.''[30] NATO's Strategic Concept refers to the ''environmental dimensions of security and stability.''[31] Environmental threats to security have also made their way onto the Security Council agenda. The 1992 Security Council Heads of State meeting identified ''non-military sources of instability in [*inter alia*] … the ecological fields'' as ''threats to peace and security.''[32] In the face of such potential threats, and despite an emphasis on their non-military nature, the option of a ''direct military response'' to ''poor environmental behaviour''[33] is not excluded from strategic considerations. States, Lothar Brock argues, could ''use military force in order to protect themselves from [the] social consequences of global environmental decay.''[34] Indeed, the possibility that ''environmental problems in one country affecting the interests of another could easily come within the purview of the Security Council''[35] – a kind of ''environmental collective security'' – is taken as a serious possibility. However, the security referent (that is, security for whom) remains the state or the international system of states. Environmental degradation is a problem for the traditional security agenda only if it is a likely contributor to conflict, might threaten state or international security, or might require military intervention of some kind.

There is little attention to human security in this version of the environmental security project. The threats are to states (and if also to persons, only incidentally). The traditional agenda is expanded to include non-military threats but the normative assumptions about traditional security remain. The cause of conflict is operationally irrelevant. Environmental degradation is thus ''securitized'' and environmental security is ''militarized.'' Environmental (in)security becomes synonymous with environmental threats to the state. Strategic and defence bureaucracies continue to define the threat to ''national'' security and appropriate responses to those threats.

Exploring environmental security as a human security concept has a number of implications for the traditional security agenda. Rather than ''reconciling'' the two, it suggests that there is a tension between them which cannot be bridged. The military model of environmental security masks the extent to which the pursuit of traditional security contributes to other forms of insecurities, including, in this case, environmental ones. It also fails to reveal the theoretical limitations of traditional security for identifying and responding to other forms of insecurity. It is, Dalby argues, ''practically dysfunctional as the discursive framework for any political arrangement'' for addressing ''pressing global problems.''[36]

The practices of war and preparation for war, which still constitute a central component of the traditional security agenda, continue to have a direct and indirect impact on the environment. ''Arms competition and

armed conflict,'' the Brundtland Commission argued, ''create major obstacles to sustainable development.''[37] The ''wanton disruption of the environment by armed conflict''[38] and the unintended (or at least overlooked) environmental consequences of war damage terrestrial and marine ecosystems and contribute to air and other forms of pollution. The use of defoliants for area denial during the Viet Nam war, for example, destroyed 14 per cent of Viet Nam's forests and severely damaged economically and ecologically important mangrove swamp ecosystems[39] as well, of course, as directly affecting the non-combatant population. Deliberate and ''unintended'' environmental damage during the 1990–91 Gulf conflict included atmospheric and marine pollution, environment-related health trauma in local populations, and damage to local ecosystems as a result of bombing, use of military vehicles, and excessive waste management and water consumption demands.[40] Indeed, pursuit of the traditional security agenda during the Cold War has left us with a legacy of environmental insecurity: nuclear and toxic waste; landmines; the ''unintended'' environmental consequences of war and war-preparation; increased environmental pressures as refugees flee conflict; sacrifice areas used for testing; lost opportunity costs; excessive and disproportionate resource use and pollution. Further, when it comes to conflict, environmental protection norms are almost always sacrificed in the interests of the conduct of war. In practice, environmental degradation in wartime has been subject to little or no accountability and is poorly covered in international law. The provisions of the 1977 Environmental Modification Convention are ''ambiguous and limited''[41] and the injunctions in Protocol 1 to the Geneva Conventions, which requires combatants ''to limit environmental destruction,'' are ''vague and permissive.''[42]

Defence establishments in a number of countries have begun to address the environmental consequences of this resource profligacy and environmental disregard. Environmental security has therefore become operationalized as ''environmentally responsible defence,'' acknowledging the impact of defence-related activities on the environment and demonstrating an apparent willingness to ''green the military'' through balancing readiness and stewardship doctrines. Military establishments are encouraged to implement environmental management strategies; to conserve resources; to protect heritage and habitat; to develop more environmentally benign weapons acquisition and disposal strategies. Any such operational attention to stewardship matters is to be welcomed from an environmental point of view, although the motivation is often driven more by the economic consequences of declining defence budgets, or by occupational health and safety requirements, than by environmental values.

Debates about the defence dimensions of the environmental agenda are now turning to the issue of ''proactive'' or ''protective'' environmen-

tal defence,[43] which would seem to engage more specifically with preventive security (recalling the UNDP's emphasis on early prevention) in the context of broader foreign policy goals. In the United States, the Department of Defense's environmental security programme has supplemented its original focus on environmental management and stewardship with an emphasis on defence environmental cooperation as a contribution to democratization and better governance. Defence forces in many countries are already well experienced in disaster response and relief activities. Defence support may also contribute to the development of civilian capabilities in areas such as anti-poaching and interdiction of smuggling activities, both of which are important to support species protection and the conservation and management of maritime and terrestrial ecosystems. The use of military assets and resources – such as personnel, data, technical and scientific capacities, environmental clean-up expertise, disaster response capabilities – for environmental monitoring and early-warning purposes is also being advanced,[44] although almost always with the caveat that national security interests should not be compromised.

The emphasis on environmentally responsible defence and preventive environmental defence is advanced in terms of a ''paradigm shift ... a different way of viewing ... present boundaries and roles'' in which the ''threat-based [military] is under assault by the notion of a capabilities-based one.''[45] Or as Sherri Goodman, US Under-Secretary of Defense for Environmental Security, suggests, thinking about environmental concerns within the military ''challenges us to embrace change, to let go of old paradigms and preconceived notions about how to do business.''[46] Although militaries world-wide are being tasked for non-combat missions and are venturing into the theatre of operations other than war, there would still seem to be little to justify claims about subversion of military purpose or a paradigm shift that might be more hospitable to human security concerns. Within the military, the view is still dominant that attention to environmental concerns beyond limited operational stewardship takes the military too far from its traditional role, that any such involvement runs the risk of dulling the sword, undermining ''core business,'' and compromising the readiness doctrine. The military, it is argued, can ''ill-afford peacetime activities that detract from wartime readiness.''[47] Descriptions such as that offered of the US Navy's new attack submarine, destined for fleet service in 2004, which draws attention simultaneously to its environmentally benign weapons system and to ''its future capabilities as a killing machine,''[48] still demonstrate an intuitive militarism that is fundamentally at odds with the ethical foundations of environmental protection and human security.

The normative assumptions that inform a ''militarized'' environmental security remain caught in realist assumptions about states, geopolitics, and threat which do little to advance the cause of environmental protec-

tion or human security. The geopolitical metaphors of traditional security – borders and boundaries and, ultimately, power acquired through dominance and deterrence – cannot account for the ecological or human imperatives of addressing environmental degradation. They marginalize a fundamental aspect of environmental change from the environmental security debates. Ecosystems do not coincide with the political space that is the state, and the concepts of sovereignty and territorial integrity that are fundamental to geopolitical security are ''difficult (if not impossible) to maintain within an ecological frame of reference.''[49] The traditional idea of an enemy ''other,'' and the strategies that this engenders, are increasingly inappropriate for defining contemporary insecurities and for determining policy responses when faced with threats without enemies. Certainly the environment is not the enemy. Rather the ''threat'' lies in the everyday activities of humans, corporations, and states, humans primarily in pursuit of quality of life, and corporations and states in pursuit of profit or economic security. The answer to the question who or what is being made secure, and from whom (or what), is not ''us'' (or ''states'') and ''the environment,'' but is, or at least should be, ''the environment'' and ''us.'' Traditional military responses are inappropriate here; as Renner argues, they ''cannot reverse resource depletion or restore lost ecological balance''[50] and, as the Brundtland Commission noted, there are ''no military solutions to environmental insecurity.''[51] The practices of ''traditional security'' are also potentially poorly adapted to meeting human security challenges. Meeting the imperatives of environmental protection requires cooperation rather than conflict. It requires openness and transparency rather than secrecy in the claimed interests of national security. As strategic analysts James Winnefeld and Mary Morris suggest, addressing environmental degradation challenges the ''customarily closed domain of national security and strategy planning.''[52]

From a human security perspective, a focus on environmental threat and conflict places too much emphasis on traditional security (modified or not) and not enough on the environment or on people. A traditional security model of environmental security also provides little scope for understanding how ''poverty, injustice, environmental degradation and conflict interact in complex and potent ways.''[53] Where poverty is factored into the analysis it is often in such a way that the structural conditions that force the poor into unsustainable practices (which are never as environmentally destructive as those of the world's far less numerous richest peoples and countries) are ignored or discounted as ''security'' concerns.

Understanding environmental security in security terms rather than environmental ones also diverts attention from the more immediate and real insecurity problems of environmental degradation and narrows pol-

icy options by focusing on symptoms rather than causes. In elaborating his concept of preventive defence, former US Defense Secretary Perry argued that security ''depends equally as much on *preventing* the conditions that lead to conflict and on helping to create the conditions for peace.''[54] Yet, as Jessica Mathews points out, the ''underlying cause of turmoil is often ignored. Instead governments address the ... instability that results.''[55] Although instability is also a contributor to human insecurity, the responses are (or at least should be) to address the *causes* of instability as a means of overcoming human and environmental insecurity. Preventing or overcoming environmental degradation will make a greater contribution to human security and, indeed, to national and international security than will mobilizing the narratives and practices of traditional security in response to that degradation.

The intellectual challenge of environmental security is one thing. The implementation challenge is quite another. Despite debates about the importance of meeting non-military threats to security, the kinds of funds required to address environmental insecurities are simply not forthcoming. Expenditure for international agencies such as UNEP in the decade 1982 to 1992 totalled only US$450 million, the equivalent of less than five hours of global military spending for the same period of time.[56] The funds available to institutions such as the Global Environment Facility total, for the latest three-year replenishment, something in the vicinity of US$2 billion (for the incremental costs to developing countries of addressing the global component of climate change, ozone depletion, biodiversity loss, and ocean pollution).

A small UN expert study group on Military Resources to the Environment identified ''preservation of the environment [as] one new channel for the vast energies released by the end of the Cold War.''[57] The UNDP made it clear that ''capturing the peace dividend''[58] was a central requirement for the move to human security. A considerable environmental peace dividend could be achieved with even small cuts. The UNDP has suggested that a 3 per cent reduction in military expenditure would have resulted in a peace dividend of about US$1.5 trillion by the year 2000.[59] Yet a report from the Worldwatch Institute notes that, although global military spending has declined since the end of the Cold War, about three-quarters of the increase in peace spending has been directed towards addressing the legacy of Cold War militarism – de-mining, weapons dismantling, repatriation of refugees who fled war and violence. What is more, since the end of the Cold War, the balance between war and peace spending has continued to lean heavily in the direction of the former: US$140 spent globally on military goods and services for each US$1 spent on peace.[60] The Gulf Allies were able to find $US60–70 billion for their efforts against Iraq at the beginning of the 1990s,[61] but cannot find

anywhere near that amount to support environmental security in its ecological or human security sense.

Environmental security viewed through a traditional security lens remains a conventional view of security, even if it identifies a nonconventional set of threats. As noted above, resistance to preventive environmental defence remains among those responsible for the ''enforcement'' of the traditional security agenda. There is also a strong resistance to the ''welfarizing'' of security as a concept. Mohammed Ayoob argues, for example, that moving beyond the traditional military-oriented definition of security ''runs the risk of making the term so elastic as to detract seriously from its utility as an analytical tool.''[62] Gleick suggests that what is required is not a ''redefinition of international or national security'' but a ''better understanding of the nature of certain threats.''[63] Others are sceptical of this apparently new-found strategic interest in environmental concerns, arguing, as Ronnie Lipschutz and John Holdren have done, that it represents little more than ''strategic analysts ... busy combing the planet for new threats to be countered.''[64] Scholars such as Daniel Deudney and Lothar Brock caution against adopting the term ''security'' to focus attention on environmental degradation. In their view, it sends us off in the wrong direction, locking environmental concerns into an inappropriate, state-centric framework and invoking the ''emotive power of nationalism.''[65] Letting military and security planners get involved in debates about environmental degradation and human security is seen to be rather akin to leaving the fox in charge of the chickens.

Pacific Asia

Environmental scarcity is a feature of Pacific Asia. This means not just the availability of traditional resources such as fish, timber, oil, and gas but also the availability and quality of environmental services including clean air, unpolluted water, arable land, and ecosystem and habitat diversity. The patterns that link economic activity, environmental inequity, and social and political tensions to human and traditional insecurities are reproduced here. Human health and welfare are closely linked to environmental scarcity. Subsistence lifestyles in the region remain heavily dependent on the ''exploitation of land, forests and water resources''[66] and still constitute the basic means of survival for over half the region's population, making them vulnerable to environmental degradation and scarcity. However, countries in the region are also increasingly high-consumption countries with growing urban populations and unsustainable demands for energy. This transition from a rural-based economy – what

Vervoorn calls the "industrialisation of Asia within the world economy"[67] – contributes disproportionately more to environmental decline in the region, further exacerbating environmental inequities between rich and poor.

Most of the region's environmental problems have been identified in one forum or another as likely causes of instability, conflict, or violence, although there is little compelling evidence, as Dupont observes, that environmental scarcity has been a "primary cause of any major subnational or inter-state conflict."[68] However, the potential for tension over resource issues, pollution, waste management, and environmental degradation is growing. Environmental decline within states exacerbates other kinds of political and social instabilities, especially in the context of poverty, internal colonization, and inequitable access to resources and environmental services. Competing groups include "tribal communities, peasants, fisher[people], miners, loggers and corporations."[69] Environmental management strategies can often contribute further to inequities if they "ignore concerns about human equity, health of ecosystems, other species and the welfare of future generations."[70] This is particularly so if access to resources is disproportionately privatized in corporate hands, when market-based pricing structures are implemented for scarce resources such as water, or when resource management infrastructure, such as dams, has severe ecological and social consequences. Environmental problems in the region are also taking on an increasingly transboundary dimension, with potential consequences for security relationships between states.

Several environmental scarcity issues in Pacific Asia stand out as particularly challenging in human and traditional security terms. Deforestation represents perhaps "the most visible evidence of the rate of environmental change" in the region.[71] On average, 1.2 per cent of forest land is lost every year, at least part of it as a result of illegal activities, often in frontier forest areas. At least 15 per cent of national land area in the region is affectd by soil degradation and over one-third of the region's arable land is vulnerable to desertification.[72] The social consequences of deforestation and land degradation include shortfalls in food production and exacerbation of poverty, as well as conflict over land tenure and access to forest lands and, in some cases, unplanned movement of peoples within countries and across borders.

Almost half the countries in the region face water stress of some kind as a result of continued overuse of water for agriculture and domestic and industrial uses, compounded by severe pollution of available water resources. The impact on local communities can be severe, and drought and economic hardship can increase competition for water resources within states. Where water is a shared and transboundary resource there is

potential for tension and even conflict over disrupted water flows or upstream activities affecting downstream water quality, especially if political relationships have been corroded by other factors. Much attention here has focused on the Mekong, which is shared by six countries, on the Tumen and Yalu rivers between China and North Korea, and on the water agreements between Malaysia and Singapore.

The maritime environment adds a further dimension to the human and traditional insecurities associated with resource and environmental issues. The potential for inter-state conflict is high where competition for access to both living and non-living resources coincides with overlapping sovereignty claims or intrusion into exclusive economic zones, or involves transboundary sources of pollution and degradation.[73] Over-fishing of most of the region's fisheries has disrupted an economic resource and diminished a major source of protein for the region's people, thus exacerbating human insecurity. Confrontation between states over illegal fishing activities and over access to increasingly scarce fish stocks is already a problem in the region.

Rising energy demands, slowed only temporarily by the economic crisis, are complicit in increased problems of air pollution and resource scarcity. Coupled with a likely decline in regional energy self-sufficiency, concerns over the maintenance of secure energy supplies have increased the potential for confrontation over resources such as oil and other hydrocarbons and over energy infrastructure such as pipelines and dams. Nuclear capability further complicates the environmental and traditional security dimensions of energy scarcities, raising concerns over the environmental and human impacts of nuclear accidents, some of which could have potential transboundary consequences, and tensions between countries over the transportation and storage of nuclear wastes.[74] Energy use is also a major factor in regional air pollution. Almost all the region's major cities exceed the World Health Organization's guidelines on particulates and sulphur dioxide, and the human insecurity costs can be high. Transboundary atmospheric pollution, particularly particulate-laden smoke and industrial acid rain, has also emerged as a real cause of friction between regional neighbours. The so-called haze incidents in South-East Asia, arising from land-clearing fires primarily in Kalimantan and Sumatra, affected human and ecosystem health, agriculture, tourism, and transportation not only in Indonesia but also in Malaysia, Brunei, Singapore, and Thailand.

Environmental decline and resource scarcity therefore clearly complicate the security challenges facing the region in a post–Cold War world. Environmental integrity is compromised, human security is undermined, and the potential for environment-related instabilities within states and confrontation between them is not to be discounted. These so-called non-

traditional security threats have now been inscribed on the agenda of official security institutions in the region, such as the ASEAN Regional Forum, as well as within the Track II process mobilized under the Council for Security Cooperation in the Asia Pacific and the ASEAN Institutes of Strategic International Studies network. The focus remains on the likelihood of environment-related conflict and violence between states or in situations where internal instability is deemed a threat to regional security.[75] In the face of such possibilities, a regional environmental security policy must ensure that the security problems of environmental scarcity are more firmly integrated into regional security architecture in order to avoid conflict, enhance cooperation, and build confidence. An environmental security policy should also devise an early warning system and spell out what will be done where scarcity-related tensions are evident and likely to worsen.[76]

However, the kinds of resolution mechanisms that arise from this modified traditional security approach can go only so far in dealing with the likely insecurity consequences of environmental scarcity in the region. On their own, they are inadequate to the task of preventing environmental conflict within or between states. More attention is required to amelioration of the likely causes of conflict through prudent environmental policies and overcoming environment-related human insecurities. Most governments in the region have established environment ministries and related agencies, instituted environmental protection programmes, and adopted various legislative initiatives to improve environmental quality. Environmental cooperation and programmes for joint action are institutionally well developed under ASEAN, although the impact of such programmes on the state of the environment in South-East Asia has been limited. The institutional framework for cooperative dialogue on the environment in North-East Asia is less well developed but not entirely absent. For the most part, however, environmental policy debates in the region are not couched in terms of their importance for regional security, despite the obvious connections. Environmental degradation continues and, with it, the likely insecurity consequences for peoples and, potentially, for states.

A regional environmental security policy therefore needs to ensure that strategies for regional environmental cooperation are strengthened and implemented for both environmental and security reasons. This requires political will, substantial resources (including greater attention from the international community), better flow of information, the adoption and transfer of environmentally sound technologies, legal structures to implement regional agreements, commonly accepted environmental standards, and immediate response capacity for environmental emergencies.[77] Finally, policies on resource and environmental management

must take account of the human security dimensions of environmental scarcity. A regional environmental security policy must recognize and respond to the social and economic drivers of environmental decline, facilitate an equitable sharing of rights to and responsibilities for habitat and resources, and ensure that local communities are included in environmental decision-making and implementation.

Conclusion

If ''environmental security'' as a concept and as a policy is to have some impact on how we think about and pursue security, it may be best achieved not through abandoning the concept but through continuing to emphasize and pursue a human security framework. Such an approach should at least move those engaged in traditional security and defence thinking from identifying ''non-military threats'' to focusing on ''operations other than war'' as the fundamental intellectual and operational purpose of ''traditional'' security planners and agents. In the final analysis, however, human security requires more than a rethinking of threats. It requires a rethinking of what security means, who it is for, and how it is to be achieved. Environmental security, Richard Falk argues, ''requires a willingness to make ... fundamental changes.''[78] Those changes have not yet been made, in either the security agenda or the environmental agenda. As then UN Secretary-General Boutros Boutros-Ghali reminded, indeed cautioned, his audience at the end of the Rio Summit in 1992, ''one day we will have to do better.''[79]

Notes

1. Norman Myers, *Ultimate Security: The Environmental Basis of Political Stability* (Washington DC: Island Press, 1996), p. 218.
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