

## **CHAPTER 9. ENVIRONMENTAL SECURITY**

### **9.2 Environmental Security: Emerging International Definitions, Perceptions, and Policy Considerations**

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Study conducted in 1997-1998 for the U.S. Army Environmental Policy Institute

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#### **Other Millennium Project studies related to environmental security:**

- 9.1 Emerging Environmental Security Issues** (ongoing scanning since 2002)
- 9.3 Environmental Security: United Nations Doctrine for Managing Environmental Issues in Military Actions** (study conducted in 1999–2000)
- 9.4 Environmental Crimes in Military Actions and the International Criminal Court (ICC)—UN Perspectives** (study conducted in 2000–2001)
- 9.5 Future International Environmental Security Issues and Potential Military Requirements over the period of 2010 to 2025** (study conducted in 2001–02)
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## 1. EXECUTIVE SUMMARY

Since “Environmental Security” was identified as an increasingly important but very poorly understood issue, the Project welcomed the opportunity to engage a cross-section of international intellects in providing a better understanding of this emerging concept. A special study was conducted to assess definitions of “Environmental Security,” including an assessment of current threats to environmental security with policies and responsibilities to insure such security. The full analysis is available at <http://millennium-project.org> and select ‘Special Studies.’

The key findings of this international study are:

1. Environmental security is an increasing issue in world affairs. Currently there is little coherence around the world about its definition, threats, and policy responsibilities. The greatest area of disagreement regarded when policy leadership should come from national governments vs international organizations.
2. Few countries have an official definition of environmental security that unifies thought and action. Among the countries that do have definitions are: The Russian Federation and the Commonwealth of Independent States; the United States which has several working definitions and a DoD Directive which includes a programmatic definition; Embassy Representatives from Argentina and India indicated that their countries did have an official definition, but the text has not been received at this writing. Respondents in China, Australia, and Hungary said their governments were currently creating a definition. China considers environmental security under the umbrella of “environmental protection.”
3. The relevant international organizations have not created a definition to guide policy. For example the United Nations Environment Program and the World Health Organization do not have definitions for environmental security, and the United Nations Development Program only refers to it briefly in its 1994 annual report on human development. NATO continues to list environmental security as among its most important priorities.
4. The elements of the definition clustered around two central concepts:
  - Repairing damage to environment (a) for human life support and (b) for the moral value of the environment itself; and
  - Preventing damage to the environment from attacks and other forms of human abuse.

Of the five suggested definitions presented to the international panel, the following two received the highest ratings:

- *Environmental security is the relative safety from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement or design and originating within or across national borders.*
- *Environmental security is the state of human-environment dynamics that includes restoration of the environment damaged by military actions, and amelioration of resource scarcities, environmental degradation, and biological threats that could lead to*

*social disorder and conflict.*

Of the eleven additional definitions offered by the panel, the following were judged by the staff of the study to offer interesting and useful alternative definitions:

- *Environmental security is the proactive minimization of anthropogenic threats to the functional integrity of the biosphere and thus to its interdependent human component.*
- *Environmental security is the concept that social (and thus political and economic) stability controls, as is controlled by, the sufficiency of natural resources.*
- *The term environmental security refers to a range of concerns that can be organized into three general categories:*

*1) concerns about the adverse impact of human activities on the environment - the emphasis here is on the security of the environment as a good in itself, for the sake of future generations, as the context for human life;*

*2) concerns about the direct and indirect effects of various forms of environmental change (especially scarcity and degradation) which may be natural or human-generated on national and regional security. Here the focus is on environmental change triggering, intensifying or generating the forms of conflict and instability relevant to conventional security thinking. Research suggests that interstate war is less likely than diffuse civil violence. A subsidiary question is: what can conventional security resources do to address these threats? Suggestions include: using intelligence data gathering and analysis assets, promoting technology transfer and dialogue through military to military contact programs, using the army corps of engineers to help tackle specific environmental problems, etc. A related question is, can military training, testing and war fighting activities be made less harmful to the environment;*

*3) concerns about the insecurity individuals and groups (from small communities to humankind) experience due to environmental change such as water scarcity, air pollution, global warming, and so on. Here the focus is on the material well-being of individuals and there is no presumption that this is a traditional security issue or that traditional security assets will be useful.*

*Combining these, we might conclude that the condition of environmental security is one in which social systems interact with ecological systems in sustainable ways, all individuals have fair and reasonable access to environmental goods, and mechanisms exist to address environmental crises and conflicts.*

5. Environmental security threats often involve transborder and/or global impacts that would require international cooperation. Nation-states acting alone can not provide environmental security. International organizations do not have the capacity to address the threats. The weight of decision power rests with national governments. As a result, national sovereignty can come in conflict with actions necessary to insure environmental security.

6. US leadership for environmental security policy within international organizations is considered necessary and desirable.

7. There is concern about the potential militarization of environmental policy. Where does the defense responsibility and definitions for environmental security begin and end relative to civilian environmental agencies?
8. There are two embryonic schools of thought regarding military budgets and the environment. One argues that money should be taken from military budgets to solve environmental problems. A World Watch report, *Fighting for Survival* argues that \$200 billion of the world's \$800 billion military budgets should be used to preserve and manage our natural environment. The view argues that the military should get involved in solving environmental problems beyond those they directly cause in operations and training. Only the military has the logistic capacity and financial resources to manage complex global programs.
9. Environmental security based on the assumption that population pressures on environment will lead to conflict is not universally correct. Environmental conditions in places as diverse as Nepal and Pittsburgh have improved with increased population. On the other hand, human creativity and the will to act intelligently to improve conditions are also not universally applied either.
10. Many environmentalists argue that fundamental changes in assumptions about life, economics, and culture are necessary to assure environmental security. Tinkering with policy and management practices they believe is simply re-arranging the chairs on the Titanic.
11. There is confusion about the difference between environmental security and sustainable development. Although sustainable development and environmental security are mutually reinforcing concepts and directions for policy, they are not the same thing. Sustainable development focuses on environmentally sound socio-economic development, while environmental security focuses on preventing conflict related to environmental factors, as well as the additional military needs to protect their forces from environmental hazards and repair military-related environmental damages.
12. The international panel identified the following (without rank order) as the most important environmental security threats over the next ten years:
  - Human population growth and loss of biodiversity
  - Climate change - not for its manifestations but for the momentum or lack of action
  - Water scarcity and pollution including ground water contamination
  - Food security
  - Environmental refugees
  - Deforestation
  - Industrial contamination of air and oceans
  - Soil conservation/erosion
  - Nuclear safety issues
  - Ozone depletion

## Global warming

13. Common conceptual frameworks will be helpful to help reduce confusion and complexity and bring more coherence to the environmental security dialogues. The charts and matrixes below were edited and found to be useful by the participants of the study. The first chart provides a framework to help organize the “big picture” thinking about environmental security:

Table 7-1 can be used to help organize thinking about the kinds of threats and policy responsibilities.

	By Ignorance and/or Mismanagement	By Intention	Mix of Natural and Human Actions
Within a Country	C.1 Oil spills in Ogoniland Nigeria Aral Sea depletion in Russia Indonesian fires Ground water contamination and fresh water scarcity Hazardous wastes Soil erosion Human settlement and development patterns	C.2 Sarin gas attack in Tokyo subway Chemical attacks and draining marshes in Iraq Poisoning or diversion or misuse of water resources	C.3 Floods Famines Salinization Earthquakes Introduction of exotic species
Trans-border	C.4 Rain forest depletion River usage in (Jordan, Nile, Tigris, Euphrates) Chernobyl Nuclear Accident Diminishing Biodiversity Ozone depletion Fisheries depletion Global climate change Acid rain and Air Pollution Poverty Radioactive waste	C.5 Burning oil fields in Kuwait Poisoning water Dam construction and water diversion Biological weapons	C.6 Solar radiation changes Global Warming New, emerging, and drug resistant diseases such as AIDS and others affecting plants and animals Desertification Population Growth Rich-Poor Gap

Such threats can also be organized by time. Futurists tend to define short-term as 0-5 years, mid-term as 5-25 years, and long-term as beyond 25 years. Environmental time scales are quite longer and depend on which subjects in nature are being considered. Time scales could be in terms of generations. It can also be organized in terms of timeliness of response such as immediate (biological weapons), soon (depletion of fisheries), and over a longer period of time (global warming). However, to begin the process, it is recommended to use the 0-5, 5-25, and beyond 25 years’ time frames.

The following matrix is intended to help the analyst organize threats by immanence of impact. This can help identify priorities: which treats require the development of policy and strategy now; which allows for more time; and which require long-range policy and strategy than must be maintained over a longer period of time.

**Time Dimension and Environmental Security Threats**

		Long-term 25 yrs+		
		Mid-term 5-25 yrs		
		Short-term 0-5 yrs		
	By Ignorance and/or Mismanagement	By Intention	Mix of Natural and Human Action	
Within a Country				
Transborder				

In a similar way, threats can also be organized by policy leadership or policy responsibility. The overall organization for environmental security would include International Organizations, National Governments, Regional Bodies, NGOs, and Corporations. Each of these would have sub-matrices, like the one below organized by national government’s responsibilities in terms of military, intelligence, and civilian agencies.

The following matrix is intended to help the analyst organize threats by policy responsibility. This can help identify jurisdictions. Different organizations could list their views of responsibilities in such a common matrix. The results would illustrate shared agreement, disagreement, and the needs for further clarification.

**Policy Dimension and Environmental Security Threats - for a National Government**

		Intelligence		
		Military		
		Civilian		
	By Ignorance and/or Mismanagement	By Intention	Mix of Natural and Human Action	
Within a Country				
Transborder				

The requirement of the Clinton administration that all Executive agencies must justify strategy, plans, and programs in terms of environmental impact in addition to more general US national policy goals has had a huge impact on the planning process of organizations that were not previously focused on environmental issues. Sherri Goodman, U.S. Deputy Undersecretary of Defense for Environmental Security has related the concept to former Secretary of Defense William Perry's notion of "preventive defense." According to Goodman, Defense's objective is to "understand where and under what circumstances environmental degradation and scarcity may contribute to instability and conflict, and to address those conditions early enough to make a difference"(August 8,1996 speech). This office also focuses on the restoration of environmental damage due to military activities and the safety of personnel due to environmental pollution.

Former U.S. Secretary of State, Warren Christopher, said in April 1996 that as we move to the 21st century, the nexus between security and the environment will become even more apparent. Unfortunately, there is little clarity about the nature of this nexus, the policies to address it, and responsibility for leadership in this area. Further, this is not simply an issue for some nations, but all nations.

French President Jacques Chirac and UNESCO Director-General Federico Mayor warned delegates from 80 countries to the Water and Sustainable Development conference in March 1998 that water wars could breakout unless international cooperation solves water problems quickly.

Without greater measures to insure environmental security, continued population and economic growth will diminish natural life support systems leading to migration and conflict. With half the world clustering into urban environments, natural disasters and global environmental change affect greater numbers of people who are dependent on civil systems for water, power, transportation, food, and other manufactured systems. Low cost and relatively simple methods - compared to nuclear weapons - for environmental destruction increase the opportunities for even small terrorist groups to destabilize large populations. Military operations and training also have environmental impacts that threaten their own troops as well as having potential long-term impacts on civilian populations. As a result, the environment is now considered in terms of human security and viewed much more urgent and important a future challenge than conventional and nuclear war - not withstanding the recent tests in India and Pakistan.(Enhancing the Economic Role of the United Nations. South Center, October 1992; Bjorkbon, L. et als., 1992Soroos, M 1989; Young, O. 1989).

## 2. INTRODUCTION AND STUDY DESIGN

A Millennium Project global assessment of future developments conducted in 1996 identified “Environmental Security” as increasingly important but poorly understood; hence, the Project welcomed the opportunity to engage a cross-section of international intellectuals in providing a better understanding of this emerging concept.

The study began with a literature survey that had three purposes: 1) to identify an advisory committee for the study; 2) to create an international environmental security panel; and 3) to draft a questionnaire for a two-round environmental security study. The advisory committee reviewed the draft questionnaire and gave general advice for the study.

### **The Advisory Committee Members were:**

Derry Allen, OPPE, U.S.EPA

Tom Beer, Commonwealth (of Australia) Scientific and Industrial Research Organization (CSIRO)

Marion Cheatle, UNEP, Nairobi, Kenya

Geoffrey Dabelko, Woodrow Wilson Center, Washington, D.C.

Francisco Dallmeier, Smithsonian Institution, Washington, D.C.

Jeff Jordan, The Futures Ground International, Washington, D.C.

Jonathan Margolis, Department of State, Washington, D.C.

John McNeill, Georgetown University, Washington, D.C.

Renet Perelet, Russian Academy of Sciences, Moscow, Russian Federation

Jamie Reaser, Smithsonian Institution, Washington, D.C.

Dave Rejeski, Council on Environmental Quality, Office of the President

Peter Rzeszotarski, Army Environmental Policy Institute, Atlanta, GA

P.J. Simmons, Carnegie Endowment for International Peace, Washington, D.C.

Jeffrey Simon, consulting company on unconventional warfare and terrorism

Bruce Tripp, Mitre, McLean, VA

Peter Timmerman, International Federation of Institutes of Advanced Studies, Toronto, Canada

Rusong Wang, Chinese Academy of Sciences, Beijing, P.R. China

Bruce Weinrod, former DOD Asst. Sec. for Europe and NATO Affairs

### **The first round of the Environmental Security Questionnaire** posed the following questions:

1) Does your country have an official definition of environmental security; 2) How should environmental security be defined; 3) What are potential threats to environmental security; and 4) What general policies should address this issue, and who should provide the leadership? The full text of rounds one and two are in Appendix H.

The first round of the questionnaire was sent to a panel of 60 individuals selected from Millennium Project participants, the literature review, individuals recommended by the Advisory Committee, and selected embassy military and environmental attaches to Washington, D.C. Those who responded are included in the participants’ list in Appendix H.



During the process of inviting embassy representatives to respond to the questionnaire, several military attaches requested that the Millennium Project conduct an informal meeting to share initial results. This provided an interesting opportunity to collect more subjective views and receive feedback not easily collected by other means. The meeting was held at the World Bank on 9 June 1998 (see appendix for list of participants). During this meeting, drafts of definitions and charts in the Executive Summary this report were evaluated for their utility and completeness. This meeting and subsequent telephone conversations with several embassy military attaches confirmed that the study had initiated dialogues in many national capitols about the nature of environmental security.

**The second round of the questionnaire** asked who should provide the policy leadership for the threats identified in the first round questionnaire. It was sent to those who attended the group discussion at the World Bank as well as to approximately twenty embassies to Washington, D.C.

In parallel to the literature survey, questionnaires, and discussion group, Dr. Renat Perelet of the Russian Academy of Science and a leading international expert on environmental security wrote a background paper for the study. The paper provides an overview of the evolution of concepts leading to environmental security as well as a discussion of the contemporary issues of environmental security. The paper was used as an additional source from which this report draws insight. The entire paper is included in Appendix H.

### 3. DEFINITIONS OF ENVIRONMENTAL SECURITY

Few countries have an official definition of environmental security that unifies thought and action. Among the countries that do have definitions are The Russian Federation and the Commonwealth of Independent States; the United States which has several working definitions and a DoD Directive which includes a programmatic definition; Embassy Representatives from Argentina and India indicated that their countries did have an official definition, but the text has not been received at this writing. Respondents in China, Australia, and Hungary said their governments were currently creating a definition. China considers environmental security under the umbrella of “environmental protection.”

The relevant international organizations have not created a definition to guide policy. For example, the United Nations Environment Program and the World Health Organization do not have definitions for environmental security and the United Nations Development Program only refers to it briefly in its 1994 annual report on human development on page 28: “Environmental threats countries are facing are a combination of the degradation of local ecosystems and that of the global system. These comprise threats to environmental security.”

A recent report on world security from the Rockefeller Brothers Fund asserts that even a general definition of security in the post-Cold War has “proven elusive,”... “despite massive efforts.” There are a range of views about environmental security reflected in official statements, policies, and international agreements. This section presents a sample of that range.

After a preliminary literature search the staff condensed a range of definitions into five candidates and presented them to the Environmental Security Panel in a questionnaire. Each definition is given below, in order of the panel’s rating, plus a distillation of their comments. The definitions were rated using the following scale:

- 1 = Excellent. Should be used as the definition*
- 2 = Extremely useful. With some modification could be used as a definition*
- 3 = Very useful, but needs elements of others to make it more complete and useful*
- 4 = Useful but incomplete. It could be used to add to other definitions*
- 5 = Not useful. Misleads the policy discussion*

#### **Preliminary Definitions and Comments**

**1.** *Environmental security is the relative public safety from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement or design and originating within or across national borders.* This definition was rated the best among thought offered with the average score of 3.2 as very useful, but needs elements of other definitions to make it more complete and useful.

Panelists’ comments on the first definition: A really good definition, equal to any I have read. I would like to see it acknowledge the complexity and the long time scales involved in cause - effect processes to foster appreciation of risk, uncertainty and longevity. Justice issues between

and among generations could also be stressed...It is difficult to operationalize very subjective issues like ignorance and mismanagement....This definition ignores (a) protection of the environment for its own sake, for aesthetic and similar reasons, or for its potential future value; b) the environmental legacy left to future generations, and c) the role of the environment in intensifying or triggering other threats to human security...It implies that any perturbation affecting public safety is a “national security” issue. This would include far too many issues.....Use of “public” safety seems inappropriate -- environmental security is not the role of any “security force” -- makes it sound like a police matter! There is also emphasis implied on the nation-state as the unit of concern. ”Relative” is used, but “relative” to what? Environmental dangers? Ignorance of what? Mismanagement of what?...Shouldn’t competition for a scarce resource be included, such as water between sectors or across borders? Also the definition addresses the human need side of the equation but it does not address protecting the environment as an end in itself....I am as concerned about the relative environmental safety from “public” (i.e. human-induced) dangers as I am about public safety from environmental dangers....seems extremely close to what is normally thought of as the domain of environmental policy and hence, redundant...definitions are not necessary; we need a new theory, new concept....add social factors, such as pursuing private profit, which effect environment security.

**2.** *Environmental security is the state of human-environment dynamics that includes restoration of the environment damaged by military actions, and amelioration of resource scarcities, environmental degradation, and biological threats that could lead to social disorder and conflict.* This definition was rated the second best with the average score of 3.45, as needing elements of other definitions to make it more complete or could be used to add to other definitions.

Panelists’ comments on the second definition: It has a useful operational focus....Very usable but “the state of human-environment dynamics” is not suitable for public communication....why limit to military & violence issues?...It suggests that the subject is the domain of the military and security planners who are at best only one actor among many in the environmental security field...combines two different definitions. “Environment damaged by military actions” is a very narrow approach (probably too narrow, but one which current military institutions would probably be most likely to accept). Perturbations which might lead to social disorder and conflict is, like the first definition, too broad....The bottom line is social, economic, and political stability maintained by maintenance of a healthy environment....Environmental security requires that we work to prevent and repair the damage we cause, in order to protect life on Earth, including our own. In terms of international issues, there is substantial concern regarding how one country’s abuse of its resources may impact people and systems elsewhere....Include reclamation and restoration of damaged environments. This definition addresses the environmental side but not human side environmental security...security is a state, restoration and amelioration are actions.

**3.** *Environmental security is the cycling of natural resources to products, to wastes, to natural resources in ways that promote social stability.* This definition received the average score of 4.4 as between incomplete and misleads the policy discussion.

Panelists' comments on the third definition: Arbitrarily narrow, vague, simplistic, economic, and overly academic. If read literally, it suggests, for example, that recycling of plastic bottles promotes social stability. This may be true, but only in an indirect way which superficial readers are not likely to quickly realize....Not cycling - environmental security is a concept, social stability is a privilege of a healthy environment....from a global, national state, or traditional security community points of view, this is far too broad. Tying it only to natural resources it cuts out huge issues (ozone depletion, or loss of habitat, which could have some national security implications)....This definition focuses on environmental processes, not security processes.

**4.** *Environmental security is the maintenance of the physical surroundings of society for its needs without diminishing the natural stock.* This definition was rated 4.1 as being useful but incomplete. It could be used to add to other definitions.

Panelists' comments on the fourth definition: Similar to the standard definition of sustainable development, a notion which has arguably proven to be of little instigative value....Excessive emphasis on natural resources only as commodities for use by humans.

**5.** *Environmental security is the freedom from social instability due to environmental degradation.* This definition received an average score of 4.15 as being useful but incomplete. It could be added to other definitions.

Panelists' comments on the fifth definition: There is much more at stake than social stability....This definition implies identifying a cause & effect relationship between social instability and environmental degradation. However, the fact that a community, region, nation, etc. is environmentally insecure does not mean that insecurity is solely or even primarily a result of environmental degradation. In other words, where social instability and environmental degradation coincide, the latter is not necessarily the cause of the former. It can actually work the other way, and other equally significant factors may be at play - such as inequities among groups (e.g., ethnic groups), population dynamics (e.g., migration).... Environmental Security is a concept, social instability is not the only by-product of environmental degradation, but an umbrella for political and economic instability. This definition misses saying that a healthy environment is the cornerstone of security....this is a result not security.

Too succinct, narrows the gamut of concerns about environmental degradation. It could also be easily appropriated by narrow military/security interests....Very vague, how would instability be defined? Also arbitrary, why should it matter whether instability is caused by environmental degradation or some other cause?....leaves out some important issues like energy security.... degradation is only part of the equation; natural disasters, and resource depletion are issues too....too unfocused....It could be first sentence of the definition 2.1....combine with 2.4.

## Alternative Definitions

The following alternative definitions were provided by the international panel:

1. Environmental security is the proactive minimization of anthropogenic threats to the functional integrity of the biosphere and thus to its interdependent human component. (Barnett, J, 1997, 'Environmental Security: Now What?', seminar, Department of International Relations, Keele University, December 4 1997.)

Staff Commentary - what is missing in this, otherwise excellent, definition is that anthropogenic threats to "the human component" of the biosphere can also come from the natural environment (excessive natural radon emissions from the ground) or natural environmental change (earthquakes, floods, mountainous mud flows, though many of them now are becoming more human-induced).

2. Environmental security is a term used by scholars and practitioners to posit linkages between environmental conditions and security interests. Although competing notions of environmental security abound, they generally fall into three sets of claims: (1) States and non-state actors should guard against environmental degradation for the same reason they guard against organized violence; both kinds of threats can harm human, material, and natural resources on a large and disruptive scale. (2) Local and regional environmental degradation and/or resource scarcities (exacerbated by population growth, inequitable wealth distribution, and global environmental changes) are an important contributing factor to sub-national political instability and violent conflict. (3) Military and security institutions (including intelligence agencies) can and should play a greater role in environmental protection. The rise in popularity of environmental security slogans has accompanied the increasingly prominent calls for new definitions of security to replace Cold War concepts predominantly rooted in Realism.

*Staff Commentary - a very good, though a bit lengthy, definition explaining a number of underlining issues.*

3. The term environmental security refers to a range of concerns that can be organized into three general categories;

i. Concerns about the adverse impact of human activities on the environment - the emphasis here is on the security of the environment as a good in itself, for the sake of future generations, as the context for human life.

ii. Concerns about the direct and indirect effects of various forms of environmental change (especially scarcity and degradation) which may be natural or human-generated on national and regional security. Here the focus is on environmental change triggering, intensifying or generating the forms of conflict and instability relevant to conventional security thinking. Research suggests that interstate war is less likely than diffuse civil violence. A subsidiary question is: what can conventional security resources do to address these threats? Suggestions include: using intelligence data gathering and analysis assets, promoting technology transfer and dialogue through military to military contact programs, using the army corps of engineers to help

tackle specific environmental problems, etc. A related question is, can military training, testing and war fighting activities be made less harmful to the environment.

iii. Concerns about the insecurity individuals and groups (from small communities to humankind) experience due to environmental change such as water scarcity, air pollution, global warming, and so on. Here the focus is on the material well-being of individuals and there is no presumption that this is a traditional security issue or that traditional security assets will be useful.

Combining these we might conclude that the condition of environmental security is one in which social systems interact with ecological systems in sustainable ways, all individuals have fair and reasonable access to environmental goods, and mechanisms exist to address environmental crises and conflicts.

*Staff Commentary - a very good definition covering, in fact, interrelationships between environmental security and sustainable development, equity issues, and conflict resolution.*

**4.** Environmental Security is a state of the target group, either individual, collective or national, being systematically protected from environmental risks caused by inappropriate ecological process due to ignorance, accident, mismanagement or design. Security in Chinese is “An-Quan,” “An” means safe confidence and “Quan” is total or system. So environmental security, according to Chinese thinking, should be a kind of confidence of the target group in surrounding physical conditions of its safety and health (individual and ecosystem), wealth (economic and natural assets or stock), and social, national or global stability.

*Staff Commentary - it is a good idea to bring in 'environmental risks,' but this definition does not explicitly consider “the security of the environment.” It can be inferred from the idea of protecting from environmental risks, e.g. environmental risks may arise if there is no nature (environmental) conservation, such as conservation of biodiversity. Otherwise, this definition is excellent and succinct.*

**5.** Environmental security is the relative public security from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement, weak management (actor pursuing private benefit so as to translate public environment capital into private economic and social capital), or by design and originating within or across national borders.

*Staff Commentary - It is overly limited to public security and fails to stress individual, community kinds of security. It is not explicit in regard to the existence of national, international and global kinds of security. In addition, the enumeration of human failures may be redundant.*

**6.** Environmental security is the concept that social (and thus political and economic) stability controls, as is controlled by, the abundance and distribution of natural resources.

*Staff Commentary - This could be improved by using the notion of "sufficiency" instead of distribution of "environmental resources" (such as the assimilating capacity or resilience of ecosystems, the water cleaning capacity of wetlands, carrying capacity, etc.). Yet, the understanding of sufficiencies are not universally accepted. Although the above is a clear conceptual statement, it is not a definition from which one could create policy.*

**7.** Environmental security is the relative public safety from environmental dangers caused by natural causes, economic activity or military actions; it includes the amelioration of resource scarcities, environmental degradation and biological threats that could lead to conflict.

*Staff Commentary - the word "Relative" brings in ambiguity.*

**8.** Environmental security addresses the consequences of environmental degradation, broadly defined to include depletion or degradation of natural resources such as air, water, land; unwise development or land use practices that may contribute to societal, political or economic instability or conflict.

*Staff Commentary - This avoids the idea that the environment can be the target of an aggressor to destabilize an opponent.*

**9.** Public safety from environmental dangers and freedom from social instability due to environmental degradation.

*Staff Commentary - Defining security in terms of safety can be misleading. In some languages - Russian is one - there is only one word for both 'security' and 'safety,' one can find the difference between them only in use. For example, Russian internal programs discuss 'environmental safety' issues, primarily as a response to the Chernobyl accident, in terms of environmentally safe factories and military activities. These discussions focus on factories and human activities being environmentally safe and sound, while 'environmental security' deals with adverse environmental impacts on humans and their societies, nation-states, and communities. When Gorbachev proposed his program of comprehensive security, the environment was treated in terms of environmental "safety," rather than security. Humans seek environmental safety in factories and environmental security in adverse changes in the environment (although, those changes may result from environmentally unsafe factories). Some view the above merely as a matter of semantics.*

**10.** Elements of 2.1 & 2.2 of the initial definitions from the Round 1 Survey should be combined for a more complete definition.

**11.** Combine definitions 2.5. and 2.1 of the initial definitions from the Round 1 Survey to make: Environmental security is the freedom from social instability due to environmental degradation.

It means the relative public safety from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement or design and originating within or across national borders.

*Staff Commentary - Environmental depletion and degradation are missing in this, otherwise good, definition. Something like “threats to human health” could be included after “social instability” and some sense of responses to environmental threats/risks could also be included.*

### **Definitions of Governments and Regional Organizations:**

**1.** The programmatic definition for the US Department of Defense Directive Number 4715.1 February 24, 1996 is: The environmental security program enhances readiness by institutionalizing the Department of Defense’s environmental, safety, and occupational health awareness, making it an integral part of the Department’s daily activities. Environmental Security is comprised of restoration, compliance, conservation, pollution prevention, environmental security technology, and international activities, which are explained, as follows:

- a. Restoration is identification, evaluation, containment, treatment, and/or removal of contamination so that it no longer poses a threat to public health and the environment.
- b. Compliance is meeting applicable statutory, Executive Order, and regulatory standards for all environmental security functions, including FGS or the Overseas Environmental Baseline Guidance Document, as appropriate.
- c. Conservation is planned management, use, and protection; continued benefit for present and future generations; and prevention of exploitation, destruction, and/or neglect of natural and cultural resources.
- d. Pollution prevention is source reduction as defined in 42 U.S.C 13101-13109 (reference (nn)), and other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or other resources; or protection of natural resources by conservation.
- e. Safety is a multifaceted program designed to prevent accidental loss of human and material resources; and protects the environment from the potentially damaging effect of DoD mishaps.
- f. Occupational health protects personnel from health risks, and includes occupational medicine e, illness and injury tend analysis, epidemiology, occupational health nursing, industrial hygiene, and radiological health.
- g. Fire and emergency services enhance combat capability by preserving life and DoD property through fire suppression, fire prevention, fire protection engineering, and emergency resources.
- h. Explosives safety protects personnel, property, and military equipment from unnecessary exposure to the hazards associated with DoD ammunition and explosives; and protects the environment from potentially damaging effects of DoD ammunition and explosives.



- i. Pest management is the prevention and control of disease vectors and pests that may adversely affect the DoD mission or military operations; the health and well-being of people; structures, material, or property.
- j. Environmental security technology consists of research, development, tests and evaluation, and regulatory certification of innovative technologies responsive to user needs.
- k. International environmental activities include bilateral or multilateral agreements, information exchanges, cooperative agreements, and specific actions, consistent with the responsibilities identified in subsection E.3, above, to bring DoD resources to bear on international military-related environmental matters or as otherwise appropriate in support of national defense policy interests.

The U.S. Department of State has not settled on one particular definition or single policy response to environmental security threats. Nonetheless, there is consensus that one effective policy response is environmental diplomacy, through which we advance U.S. interests bilaterally (e.g., Pacific Salmon, cross-border pollution between Mexico and the United States); regionally (e.g., freshwater, forest conservation); and globally (e.g., climate change, marine conservation, protection of biodiversity, toxic chemicals reduction and management).

**2. Russian Federation:** “Environmental security is protectedness of natural environment and vital interests of citizens, society, the state from internal and external impacts, adverse processes and trends in development that threaten human health, biodiversity and sustainable functioning of ecosystems, and survival of humankind. Environmental security is an integral part of Russia's national security.” (as adopted at a meeting of the inter-agency commission on environmental security on October 13, 1994, ref. “*Environmental security of Russia*”, issue 2, The Security Council of the Russian Federation, Moscow, 1996, p.55).

**3. The Commonwealth of Independent States.** (CIS) adopted an advisory legislative act “On Environmental Security” 1996 with the following definitions: “*Environmental security* is the state of protection of vital interests of the individual, society, natural environment from threats resulting from anthropogenic and natural impacts on the environment.” “*Environmental danger* is the state posing a threat to vitally important interests of the individual, to society and the natural environment as a result of anthropogenic and natural impacts on it (natural environment).” Earlier, on November 29, 1992, an advisory legislative act “On Principles of Environmental security in the Commonwealth states” was adopted. More recently, on December 4, 1997, a decision was made to elaborate a *convention on environmental security* which is being developed.

**4. NATO.** The 1997 NATO science program priority areas included “scientific problems related to environmental security including the reclamation of contaminated military sites, regional environmental problems and natural and man-made disasters; affordable cleanup

technologies are of particular interest.

**5.** Although not an official military definition, Conrad F. Newberry, U.S. Naval Postgraduate School and John H. Grubbs, U.S. Military Academy offer the following definition in their paper for the 1997 American Society for Engineering and Education: “the response to perceived internal or trans-boundary threats to either the quality-of-life of the inhabitants of a state or to a reduction in quality-of-life policy options available to either private or government entities within the state.”

#### 4. ENVIRONMENTAL SECURITY THREATS AND POLICY LEADERSHIP RESPONSIBILITIES

In the first round of the questionnaire, the international panel was given the matrix below and asked to identify additional threats to environmental security. The panel's responses that follow are organized via the same matrix cell numbers.

Environmental Threat Matrix

	By Ignorance and/or Mismanagement	By Intention	Mix of Natural and Human Action
Within a Country	C.1 Oil spills in Ogoniland Nigeria Aral Sea depletion in Russia Indonesian fires Ground water contamination Hazardous wastes	C.2 Sarin gas attack in Tokyo subway  Chemical attacks in Iraq	C.3 Floods Famines Salinization
Trans-border	C.4 Rain forest depletion River usage in (Jordan, Nile, Tigris, Euphrates) Chernobyl Nuclear Accident Diminishing Biodiversity Ozone depletion	C.5 Burning oil fields in Kuwait	C.6 Solar radiation changes Global Warming AIDS

In the second round, the panel was asked to identify who should have the policy leadership to address these threats identified in the first round using the numbers below:

- 1 = International Organizations (UN, UN organizations and affiliated institutions, and regional bodies like NATO and OAS)
- 2 = National Government's Military Organizations
- 3 = National Government's Civilian Agencies
- 4 = National Government's Intelligence Agencies
- 5 = Corporations, Private Sector
- 6 = NGOs
- 7 = Not clear who has the lead-responsibility
- 8 = Others, specify.

The numbers within the parenthesis after the threats listed below refer to the panel's judgements of which of the above institutions have policy leadership.

## **C1 *Within a Country, By Ignorance and/or Mismanagement***

### **Examples of current or previous threats**

Oil spills in Ogoniland Nigeria (3 with some from 5)  
 Aral Sea depletion in Russia (3 with some from 1)  
 Indonesian fires (3 with some from 1)  
 Ground water contamination (3 with some from 1)  
 Hazardous wastes (3 with some from 5)

### **Future threats**

Particulate emission in power plants and factories (no agreement)  
 Over fishing, and environmentally irresponsible fishing techniques including bottom trawling, long-lining, use of fine-mesh nets, muro ami, and dynamite fishing (3 with some from 1 and 6)  
 Extraction and transport of oil and other resources in environmentally sensitive areas (1 and 3)  
 Transportation of alien species into new ecosystems (both 1 and 3)  
 Chemicalisation of sources and sinks causing depletion of human health and reproductive capacity (3 and 1)  
 Water scarcity (especially in the Middle East, parts of Africa and China) (1 and 3)  
 Soil erosion (worldwide problem) (1 and 3 with some 6)  
 Disease epidemics (e.g., cholera in Peru 1991) (3 with some from 1)  
 Old growth forests depletion (3)  
 Radioactive waste management; underground nuclear waste storage tanks (3 with some 2)  
 Solid waste (3)  
 Urban oil burning power plants (3)  
 Disposal of hazardous/toxic wastes (3 with some from 1, 2, and 5)  
 Increasing and intensive using of chemical fertilizer, pesticide and detergents (3 with some from 1 and 5)  
 Depletion/Damming of internal rivers causing ecological change (3)  
 Contamination of soil through spills or leakage of solid/liquids requiring remediation (3 & 1)  
 Lack of effective exploitation of mineral resource scattering in village and local level with primary technology; without or lack of effective official management (3 with some 1)  
 Over-consumption trends around the world (1)  
 Settlement/development, or encroachment onto hazardous environments such as riverine and coastal flood plains, earthquake-prone and volcanically active zones (3 with some 1)  
 Settlement/development/misuse of sensitive/hazardous or unsustainable development environments such as marginal grasslands/arid environments (3 with some 1)  
 Settlement/development/misuse of ecologically sensitive zones such as certain forest, desert, wetland and marine environments (3 with some 1)  
 Diversion/misuse of water resources such as diversion of water courses to agricultural or urban areas at the expense of draining environmentally sensitive wetlands (3 with some 1)

**C2 *Within a Country, By Intention*****Current or previous threats**

Sarin gas attack in Tokyo subway (4 with some 1 and 3)

Chemical attacks in Iraq (1 with 3, 4, and 7)

**Future threats**

Draining of southern marshes in Iraq (1 and 3)

Use of specialized equipment by some bottom trawlers which is specifically designed to “condition” the sea floor by leveling rock formations and coral heads which serve as critical habit for local species (1 with some 3)

Poisoning of water resources (groundwater and surface water) (3 with some from 4 and 1)

Rapid development of rural industrial development in China, some of them are heavily polluted industries taking the strategies of “Pollution first, treatment followed” (3 with 1 and some from 5)

Soil erosion due to increasing population demand for food (1 with some from 3 and 6)

Diversion/misuse of water resources such as diversion of water courses to agricultural or urban areas at the expense of draining environmentally sensitive wetlands (1 &3)

**C3 *Within a Country, Mix of Natural and Human Action*****Current or previous threats**

Floods (1 and 3)

Famines (1 with some from 3)

Salinization (1 and 3)

**Future threats**

Fires like those in Indonesian were not solely an in-country threat to environmental security - neighboring countries like Malaysia and Singapore were strongly affected (1)

Transport of species/introduction of non-native species (1 and 3)

Fishery depletion (1 and 3 with some from 6)

Earthquakes disasters (3, 1 with some from 2, 4, and 6)

Falling river flows and even stopping (e.g., lower reach of the Yellow River in China)(3)

Settlement/development/misuse of sensitive/hazardous or unsustainable development environments such as marginal grasslands/arid environments (3 with some 1)

Settlement/development or encroachment onto hazardous environments such as riverine and coastal flood plains, earthquake-prone and volcanically active zones (3 some 1)

Settlement/development/misuse of ecologically sensitive zones such as certain forest, desert, wetland and marine environments (3 with some 1)

**C4 *Trans-border, By Ignorance and/or Mismanagement*****Current or previous threats**

- Rain forest depletion (1)
- River usage in (Jordan, Nile, Tigris, Euphrates) (1 with some 3)
- Chernobyl Nuclear Accident (1 and 3 with some 2)
- Diminishing Biodiversity (1 with some 3 and 4)
- Ozone depletion (1)

**Future threats**

- Depletion of Fisheries (1)
- Extraction and transport of oil and other resources in environmentally sensitive areas (1)
- Transportation of alien species into new ecosystems (1)
- Chemicalisation of sources and sinks causing depletion of human health and reproductive capacity (1)
- Ozone layer depletion (1)
- Global climate change due to greenhouse gases (1 with some 3 and 5)
- Air pollution and acid rain in newly industrialized countries using old technologies (China, India, Brazil, South Africa) (1 and 3 some 5)
- Poverty (1 and 3 with some 6)
- Low radiation from accidents occurring in old nuclear power-plants (3 with some 1 and 2)
- Spills from stockpiles of “old weapons” (all 1, 2, and 3)
- Radioactive waste management (3 with some 1 and 2)
- Disposal of chemical and biological wastes (3, 2 and 1)
- Water competition and dam construction (3 and 1)
- The huge amount of coal burning in China (around 800 million tons of coals directly burned annually) (3 with some 1 and 5)
- Over fishing of threatened species e.g. Southern Bluefin Tuna and Patagonia Tooth Fish (1 and 3)
- Environmental impacts of mismanaged human migrations (1)
- Scarcity of fossil energy (oil/gas), other scarce sources (1 with some 3)
- Settlement/development/misuse of sensitive/hazardous or unsustainable development environments such as marginal grasslands/arid environments (3 and 1)
- Settlement/development or encroachment onto hazardous environments such as riverine and coastal flood plains, earthquake-prone and volcanically active zones (1 and 3)
- Diversion/misuse of water resources such as diversion of water courses to agricultural or urban areas at the expense of draining environmentally sensitive wetlands (1 and 3)
- Settlement/development/misuse of ecologically sensitive zones such as certain forest, desert, wetland and marine environments (3 and 1)

**C5 *Trans-border, by Intention*****Current or previous threats**

Burning oil fields in Kuwait (1 with some from 3 and 6)

**Future threats**

Poisoning water resources (groundwater and surface water) (1 with some 3)

River usage/control (see C4 , add Brahmaputra, etc). Dam construction in Turkey-Iraq (competition for water), in N. Korea-S Korea. Diversion/misuse of water resources such as diversion of water courses to agricultural or urban areas at the expense of draining environmentally sensitive wetlands (1 with some 3)

Use of specialized equipment by some bottom trawlers which is specifically designed to “condition” the sea floor by leveling rock formations and coral heads which serve as critical habit for local species (1 with some 3)

**C6 *Trans-border, Mix of Natural and Human Action*****Current or previous threats**

Solar radiation changes (1 with some 3)

Global Warming (1 with some 3)

AIDS (1 with some 3)

**Future threats**

Emerging diseases (1 with a little from 3 and 4)

Spread of drug resistant infectious disease (1 with some 3)

Ice storm disaster in Quebec and eastern Ontario (3 and 1 with some 2)

Human population growth (1 with some 3 and 6)

Poverty and the widening gap between “ rich and poor” (3 and 1)

Increasing spiritual disconnectedness from Nature (1)

Big fires that are occurring , more and more frequently in the rain forest (Indonesia, Australia, Amazonia) and Mediterranean countries (1 with some 3)

Desertification (1 with some 3)

Infectious disease of plants and animals (1 with some 3)

Settlement/development/misuse of sensitive/hazardous or unsustainable development environments such as marginal grasslands/arid environments (1 with some 3)

Settlement/development or encroachment onto hazardous environments such as riverine and coastal flood plains, earthquake-prone and volcanically active zones (1 with some 3)

Settlement/development/misuse of ecologically sensitive zones such as certain forest, desert, wetland and marine environments (1 with some 3)

After assigning policy leadership responsibilities to the threats above, the international panel was asked what it expected to be the one or two most important environmental security threats within the next ten years. The following are the panelists' responses, which have not been rank ordered:

Human population growth and loss of biodiversity

Climate change - not for its manifestations but for the momentum or lack of action

Water scarcity and pollution including ground water contamination

Food security

Environmental refugees

Deforestation

Industrial contamination of air and oceans

Soil conservation/erosion

Nuclear safety issues

Ozone depletion

Global warming

**Panel's Comments to Change the Matrix for Environmental Security Threats:**

**Comment:** Whilst I appreciate the intent, I find this framework to be very limiting and constricting. If you follow the view that PEOPLE are the prime concern when considering environmental security, the distinction between 'within a country' and 'transborder' seems rather arbitrary and beside the point. In a sense this framework reproduces the security bias inherent in most understandings of 'environmental security.'

**Comment:** Most of your 'in country' examples are really transborder examples. I don't see sarin gas attack as directly applicable. (*Staff comment: the sarin gas attack is an example of what could escalate. The event itself was not a matter of national security, but if it is the beginning of a trend, then it is an early indicator of national and international security concerns. Some reports indicated that the terrorists did try to get sample of the ebola to use instead.*) Virtually all could be C3 or C6. Need to balance between specific and general examples. Any activity influencing the pattern and health of biodiversity and the amount and distribution of natural resource products affects environmental security.

**Comment:** The problem with this list is it assumes a 'global citizen' approach, whereas almost by definition 'national security' can only be defined within the context of the interests of a



specific national state. If environmental security is a component of post Cold War enhanced national security, then it must, at least initially, reflect the interests of a specific national state.

**Comment:** I found myself having difficulty separating mismanagement from intentional damage, i.e., deforestation and loss of biodiversity. Please know the results of clear-cutting forests. Is that by intention or mismanagement? Losing biodiversity is perhaps not the goal of clear-cutting, but explaining destructive economic practices as mismanagement lessens the indictment and helps maintain the optimism that minor managerial adjustments can remedy the problem, when in fact fundamental assumptions must be questioned.

**Comment:** I think distinguishing among the sources of problems (between intentional, mismanagement, combination of national and human factors) and between location (within a country, transborder, etc) is great. But that's only a portion of what would be necessary in a matrix aimed at evaluating priorities or identifying environmental problems that might lead to harmful effects that could be construed as 'security' problems. Such a matrix would have to be far more complex, and would be very difficult to construct for the same reasons alluded to above in finding a common definition for security: everyone has a different view of whose security is important (individual, region, nation, panda bear, ecosystem, etc) and what constitutes a security issue.

**Comment:** Unfortunately, environmental pollution/contamination resulting from military activities, both during the war or at peace time, has not been given prominence. Russia is a good example of the multitude of such cases, with lakes contaminated with radioactive wastes (near Chelyabinsk, Southern Urals), huge trails of liquid the hazardous fuel (heptin) sprayed on the ground for hundreds kilometers along the trajectory of satellite launching missiles, radiation leaks during nuclear tests near Semipalatinsk (now Kazakhstan) and Novaya Zemlya, exhaust emissions from military personnel carriers, tanks, applying defoliants, etc. to say nothing about the routine military textbook practice of contaminating drinking water from wells and pipelines (Vietnam, Afghanistan, etc.). I would classify such causes as by intention.

## 5. DISCUSSION OF ENVIRONMENTAL SECURITY ISSUES

### Issues about Defining Environmental Security

Most respondents welcomed the opportunity to define environmental security and thought it was the next step toward better policy. However, there were some opposing views that are shared below in no particular order. They are numbered for easy reference.

**Comment 1:** The causes, manifestations, consequences, etc. of environmental insecurity are so diverse as to defy useful encapsulation in one pithy definition. Any definition that attempts this risks being too generalized (or perhaps too technical/obtuse) to satisfactorily serve its intended audience. It may be better to instead separately focus on the components of environmental security - food security, water security, security from infectious disease, security from exposure to hazardous waste, etc. - an approach already well under way.

*Staff comment - A well put issue. Both approaches could be integrated, a concise definition with a good commentary explaining it.*

**Comment 2:** Environmental security (or insecurity) manifests itself in individual lives, households, communities, regions, nation-states, globally ("communities" here includes those as traditionally defined AND others less often described as such - women, ethnic groups, etc.). Environmental security at the higher levels should be viewed as rooted in security at the lower ones. An environmentally secure state, if assessed by macro-level/aggregate indicators (qualitative or quantitative) is not likely to also be one where environmental security is enjoyed at all sub-national levels. But the converse is more likely, that is, where environmental security is enjoyed at all sub-national levels, the nation-state may be more likely to itself be environmentally secure.

Attempts to identify water secure nations, for example, have fallen into a trap by using aggregate per capita measures without recognizing seasonal fluctuations, regional disparities, rural-urban differences, etc. The point here is to suggest that definition of environmental security should focus on sub-national as well as national and global levels. Many of the proposed definitions do not draw adequate attention to sub-national concerns. They seem written more for the use of those interested in national/international security. The foundation of this security is likely to be shaky in the absence of security down to the individual/household level. Insurgencies taking root in disenfranchised, environmentally insecure (often rural) communities may be testimony to this.

*Staff comment - a very good example of comments emphasizing different dimensions of environmental security - spatial regionally, geographically and socially - politically, administratively (such as national, supra- or sub-nationally), social group related (such as community, households, etc.) and temporary.*

**Comment 3:** Many scholars and practitioners question the operational utility and analytical appropriateness of linking environmental issues with security, raising arguments along the following lines: (1) threats to well-being are fundamentally different from military threats; (2)

overly broad definitions of security render the term useless; (3) environmental security is merely another tactic used by developed countries to impose their values on developing countries and infringe upon their sovereignty; (4) there is a fundamental mismatch between the means required for sustainable development--marked by transparency, cooperation and public participation--and the conflict orientation of security institutions; (5) environmental security rhetoric encourages thinking that could lead nations to undertake military intervention in the name of protecting "global" resources; (6) empirical findings that environmental scarcities contribute to violent conflicts are questionable, as environmental factors are at best tangentially related to conflict and in any case are overshadowed by more important socio-political and economic variables. (Written for the forthcoming Routledge Encyclopedia of International Political Economy by R.J.B. Jones, Ed., University of Reading, UK)

*Staff comment - the above comments are extremely relevant in environmental security considerations. Seeking indicators of environmental security could be a useful endeavor. One may recall that the notion of 'sustainable development' was similarly under attack because of the lack of its operation ability.*

**Comment 4:** I think all of the proposed definitions for environmental security are equally well-constructed and encompass many different conceptions. But I think trying to find a common definition for the term is a wild goose chase (only small subsets of the diverse group of actors interested in the myriad topics associated with "environmental security" would ever be able to agree on a definition at any given time)...the debate over the meaning of 'security' [I feel the same way about environmental security] ...stems from the struggle to create a way of understanding a world that lacks any one great overarching unifying threat. Some of the efforts to redefine security appear to throw the security label at everything in hopes that the word alone will create a conceptual framework through which a confusing world can be understood. This has had positive effects, bringing together intellectual communities across disciplinary boundaries. But a label does not a framework create....It is not clear that much is gained by continuing to debate what to include under the rubric of "security." Too much disagreement exists about whose security matters, about how the various new "threats" interact, and about where policy interventions could be most effective. These disagreements will not readily resolve themselves. Addressing them directly might prove a more fruitful avenue than debating how to label the category. In other words, I really dislike the term "environmental security" because it cannot have one definition!

*Staff comment - a thoughtful remark responded to earlier above.*

**Comment 5:** I think that a number of the definitions would suit a conventional definition of environmental security, but I have always resisted these definitions, because I do not believe the way the subject is currently discussed comes close to the core of environmental security as a concept that would embrace the current situation or the human response to the situation that ought to be reflected in the term. The term (as is well known) comes out of a mixture of language used by the military and more recently by traditional environmental groups and social thinkers. And, as a subject, it is cast very powerfully in managerial terms. While this is useful in predictable ways, the term is not being used deeply enough.

I think it is important to provide a space for thinking about environmental security in a much more anthropological, personal, or (to use the jargon) phenomenological sense. This is certainly what is happening in some European quarters. If we define environmental security as "how people assume or expect stability in the world around them," then the main threats that we now face are in some sense threats to the fundamental fabric of life. These threats undermine a range of hitherto assumed background environments, which were so fundamental no one ever assumed they could be threatened. These include, for example, the sky, rain, the rhythm of the seasons, and so on. A colleague of mine refers to the loss of species as similar to the feeling one gets when one goes down a set of basement steps and one step is missing. There is a sense that something is falling out of one's life that was an anchor -- predictable, and part of one's self-identity.

Perhaps a more useful example or metaphor is the idea of the environment as embodying the physical memory of the earth, and we are witnessing a kind of Alzheimer's or worse. We are losing cherished parts of our memory, and it undermines our environmental security; just as an aging person panics when they can no longer remember certain basic tasks. The real frontier for environmental security concerns is rapidly becoming the edge of the human body, because it seems to be a final and yet fragile borderland between ourselves and the outside world. The threat from biological weapons (see this week's *New Yorker* on the latest panic) and the intensification of genetic experimentation are creating intense anxiety. The notion that there was a defensible border between some supposed "environment" and the "self" is being assaulted. Where do I end (my identity, my area of semi-control)? This helps explain the current obsessions with immune systems, the body, the Internet, boundaries and borders. The very notion of an "environment" is now insecure.

In this kind of an environment it is not clear how to answer the last half of your questionnaire. Traditional environmental groups have not been very good at translating their concern for the natural environment to the new realm of environmental insecurity -- even though they have been among the earliest to point to the health threats of endocrine disruptors, etc. The increasing connection between the information assessing agendas of the scientific community and the various forces driving towards globalization has not been remotely addressed by anyone.

Turning everything into information as a preliminary step before turning it into a commodity (including the environment, traditional knowledge, and personal genetic codes) is the greatest threat to environmental security I know of, since when everything can be denominated in one currency, then intrinsic identity disappears, you are definable in terms of something else -- which is the heart of the current anxiety and insecurity manifesting itself as "environmental insecurity." But all the international institutions with which I am familiar are devoted to this project in one way or another.

*Staff comment - although the thoughts above are important considerations for developing the notion of environmental security and should be kept in mind, though they do not immediately lead to the utility of the environmental security notion.*

**Comment 6:** It's not necessary to give out the new concept, we have enough concepts. A good new concept should be based on a new theory. I don't know what's new about the environmental security concept. There is no universal agreement about environmental security, hence, what is the old concept to which you refer that we should list?- e.g. environmental degradation, environmental decline.

*Staff Comment - the author of these comments makes a very good point about the need to prove why the notion of environmental security is needed, and why it is more practical than such notions as environmental degradation, environmental decline, as well as, we would add, environmental protection and sustainable development. To some degree this report is addressing this concern by exploring a range of views on the definitions, issues, and values of environmental security.*

**Comment 7:** While the lack of consensus on definitions can be somewhat of a hindrance in discussing policy options, I would caution against elevating one definition over another. We would welcome an elaboration on which definitions have proven most helpful to whom, and in what circumstances.

**Comment 8:** A definition of environmental security can either flow from top down - “this is environmental security” - or be built up as a result of experience. We have too much of the former and not enough study of the latter.

**Comment 9:** From a military perspective, in addition to conflict prevention due to environmental factors, environmental security must focus on: 1) Force Protection, protecting health of the soldier to carry out the mission. This should remain priority from peacetime to operations other than war to war; 2) Multinational Force Compatibility to ensure similar environment, safety and health standards are achieved to protect coalition forces to carry out the mission. This should remain priority from peacetime to operations other than war to war; and 3) Environment and human health protection to reduce present and future damage and costs. This is along the lines of controlling collateral damage and strategic use of natural resources in such a way that military action does not create widespread devastation of environment and effects to public health as was the case with the Kuwait oil fires. Placing emphasis on this issue, in support of Laws of War, may greatly reduce post-war, operations other than war, activities/costs by both military and civilian government and non-governmental organizations.

**Comment 10:** Wording for the definition depends on whether it is to heighten concern among the public masses, or to mobilize bureaucratic resources across governmental agencies, or to galvanize new thinking among policy experts.

**Comment 11:** Environmental security vs environmental protection. One should have a clear meaning of the adjective 'environmental' in the notion of environmental security. For example, in the environmental management is not the management of the environment (we should not assume to be 'God') but the management of human activities that affect the environment. This approach is well accepted. In the definition of environmental security my understanding has always been along the same line of reasoning, i.e., we talk about human security from threats that come from adverse (as regards humans are concerned) changes in the environment. We call

them environmental threats. Here, we follow the logic of such notions as *economic security*, *food security*, *social security*, and even *military security*. We do not talk about the security of food, for example. We would rather say 'food safety.' Some definitions consider the environmental security also as the security of the environment. In the conventional parlance that means the protection of the environment, or, for short, 'environmental protection'. Frankly, I have nothing against it. If the consensus can be reached on that I would only be happy.

Environmental security versus environmental safety. But then, if we tread this path, we should also include 'environmental safety' into the definition of the environmental security. The notion of 'environmental safety' belongs linguistically to still another logic or another way of coining notions such as *industrial safety*, *nuclear safety*, etc. Here we discuss how safe are *industrial* gadgets, machine tools, factories or *nuclear* reactors, nuclear power stations, nuclear wastes for humans (we usually talk about industrial or nuclear risks, seldom using the word 'threats' in this context). In the case of environmental safety we talk about the safety of specific industrial facilities (as well as power stations, agricultural farms, etc.) for humans through environmental media if they negatively affect the environment polluting the air, water, soil and generating too much wastes, i.e. how they observe environmental standards of emissions, discharges, etc. There environmental safety standards and norms of pollution emission levels/concentrations for economic agents to operationalize this notion.

In sum, I would be happy to accept the notion of 'environmental security' as one overarching the notions of environmental component of human security, environmental protection, and environmental safety. Next, one should make a good list of environmental security indicators. Still, one should clearly prove the necessity and prudence of bringing the notions of environmental security and environmental safety under the umbrella of environmental security.

## **6. ENVIRONMENTAL SECURITY VERSUS SUSTAINABLE DEVELOPMENT**

Although sustainable development and environmental security are mutually reinforcing concepts and directions for policy, they are not the same thing. Sustainable development focuses on environmentally sound development that is economically, financially, socially, and environmentally sustainable. Environmental security focuses more on preventing conflict and loss of state authority due to environmental factors, as well as the additional military needs to protect their forces from environmental hazards and repair military-related environmental damages. The UN and related commissions and conferences have popularized sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their own needs. There is not yet a similar universal definition of environmental security.

### **Some comments stressed the linkage between environmental security and sustainability:**

Most urgent environmental security issues are related to scarcity of renewable resources like water and land....there is a need for environmental policy reform, in light of the mismatch between existing global management capacity and likely threats to environmental resources...The linkage between population growth, environmental security and sustainable development must be made and accepted by all the actors and mass publics worldwide. This may appear to be an impossible task but these problems must be tackled simultaneously at all levels of world society. Acceptance of a new vision or metaphor of what constitutes "the good life" will be required.

Sustainable development is a key aspect of the condition of environmental security and should be promoted through a variety of mechanisms including education, steering national economies with tax and subsidy programs, promoting green technology innovation, diffusion and implementation, and strengthening multilateral environmental agreements (MEAs). In particular, it is important to study the effectiveness of MEAs and determine ways in which (a) compliance can be improved and (b) standards can be strengthened.

## 7. GENERAL OR MISCELLANEOUS ISSUES ABOUT ENVIRONMENTAL SECURITY

There were a number of questions and issues that did not neatly fit into other categories, but may be of value for policy consideration. They have been identified during the study, but have not be rated for importance by the panel. Hence, no conclusions should be drawn from the sequence of their listing below. They are numbered for easier reference.

1. Sovereignty vs environmental security: Since an environmental problem in one country can be so serious that it endangers other countries, the right of self-defense could conflict with national sovereignty. What should the appropriate procedure be to address this situation?
2. National vs International responsibilities. The section on threats and policy leadership shows that there are many items which could lead to create problems about who should provide policy leadership.
3. The view that environmental security will militarize environmental programs expresses, “a pessimism about the ability to change existing security institutions and mind sets...a militarization of approaches to the environment is more likely than a greening of security.” (Florini and Simmons, 1998.)
4. To classify or not to classify. Since environmental issues by definition can be affected by all sectors of society, how should the military address secrecy?
5. What percent of the Army’s capacity should be used for deterrence of transborder military incursions of the US and its allies, and what percent for logistical and related support for countries with potential environmentally driven conflicts?
6. Will money be taken from military budgets to solve environmental problems or will the military get involved in solving environmental problems beyond those they directly cause in training and other activities? Renner in *Fighting for Survival*, a World Watch report, argues that US\$200 billion of the world’s \$800 billion military budgets should be used to preserve and manage our natural environment.
7. Significant barriers to promoting global environmental security include: drive for short-term profit at the expense of long-term sustainability; multinational corporations which exploit, destroy, and then move on to greener pastures, leaving environmental degradation and destruction of communities in their wake; the tradition of the open ocean being fair game for any country that wishes to exploit its resources, regardless of the cost to the rest of the planet; and the perception in developing countries that it’s only fair that they be free to squander their natural resource capital just as First World countries already have.
8. Militarization of Environmental Policy. Where does the defense responsibility and definitions for environmental security begin and end relative to civilian environmental agencies?
9. Fundamental changes in assumptions about life, economics, and culture are necessary to assure environmental security. Tinkering with policy and management practices are just re-



arranging the chairs on the Titanic.

10. Assumptions may be wrong. The assumption that population pressures on environment will lead to conflict are not universally true. Environmental conditions in Nepal, Pittsburgh, etc. have improved with increased population. On the other hand, human creativity to improve conditions is not universally correct either; some groups lose.

11. Environmental security is viewed more clearly from a global perspective than a national one, e.g., why would addressing global warming the responsibility of a national army? ...On the other hand, decisions are made nationally, not globally.

12. Environmental security discussions should adopt a broader and more humanitarian focus. It is not merely a matter of national resilience in the future, but of the survival of disaffected individuals throughout the world in the here and now.... Environmental security should take into consideration global interests and rights of future generations.

## 8. POLICIES AND LEADERSHIP RESPONSIBILITIES

One of the objectives of this study was to collect a range of views from the participants about policies that might be involved in assuring environmental security and the institutions and organizations that might be responsible for forming and implementing these policies. Although the participants had a wide range of opinions about these matters and often differed significantly in their views, some common themes and questions emerged from their contributions. These and significant points of view are reported in this section.

Foremost among these themes were questions of leadership and responsibility, enforcement, international agreements, national interests and military implications, and means and modes of cooperation.

***1. Who should have the responsibility for assuring environmental security? The principal answers: national governments; UN agencies; and, for at least a few respondents, new institutions.***

UN agencies should lead, but implementation..... requires all levels and all divisions within national bureaucracies to instigate reform.

....Nearly every one of the issues require coordination and execution by a variety of organizations, both international and domestic, in order to develop effective policies and solutions. I believe that nearly every issue requires a civilian government entity to set policy, and often, to energize other organizations to assist with the work, whether that is militaries, intelligence communities, NGOs, businesses, etc. Except for the civilian government, and on many occasions IGOs, the organizations such as the military will not or should not act on their own regarding these issues. The others may act, generally affecting small scale, localized solutions, or by creating enormous environmental blunders as in the case of a particular international financial institution during the 1970s and 80s. The latter is one reason why broad effective policy must be developed that includes bringing all players to the table. Civilian governments and IGOs are likely in a better position to accomplish this task, providing they have legitimacy and the willingness to do so.

....All the organizations should set internal policies on how to deal with a variety of these situations. In the case of militaries and the governmental intelligence communities, their policies should be reflecting the broader policy direction set forth by the political leadership and in coordination with civilian agency policies. Thus, militaries and intelligence communities should not be acting without full coordination with the civilian government. Importantly, it is the civilian government that should be setting the major policies for nearly all of the issues in this questionnaire. They may choose to have their militaries and intelligence communities step forward to support when necessary, generally in times of crisis; however, military and intelligence responses are not the solution for any of these complex issues.

The primary point of coordination should be a political entity above the level of the state. Yet the formal and 'group of states' represented by the regional examples may still be too state-

based. One should hope regional and international structures would also work better with NGOs.

Commitment to environmental security must be at highest level of government (i.e. President, Governor or provincial administration, and local leader)..... Environmental issues should not be relegated to an Environmental Ministry but rather be a priority. Annual reporting should be a requirement of all agencies. This process will only have an impact if the top level of government supports this priority and holds agencies accountable.

Governments of each country should assume responsibility for protecting natural resources and enforcing regulations and international agreements. In addition, an international organization should be empowered to protect natural resources in situations where countries openly defy international conventions (e.g. Japan and Norway's ongoing whaling activities). Such an organization (whether a newly created one, or something stemming from existing organizations) needs to have the teeth to effectively enforce these agreements.

Any international issue which crosses traditional lines should normally be coordinated at the State Department with appropriate involvement by the National Security Council on key issues or initiatives. The relevant agencies and offices in the USG should of course make contact with and seek the aid of international organizations. The U.S. Department of Defense should stay focused on those matters closest to its missions and which it knows best including clean-up of military facilities and deterrence or prevention of military aggression involving environmental degradation. In general, new institutions would be duplicative, there would be a strong domestic reaction in the U.S. to any efforts to assert any sort of international sovereignty over U.S. domestic activities. Thus, developers of policies, to be effective, should keep this reality in mind as they consider how to proceed.

My main concern is that corporations, NGOs , government agencies and international agencies should be involved in the discussion to formulate, promulgate, expedite and implement these policy instruments. The progress with Rio 92, limited though it is, encourages me about such a process.

Environmental Security has to be an integral part of a nation's foreign policy; it cannot be pursued in isolation by lower level organizations. Therefore national governments should lead in policy development. Ministries/departments can only act within national guidelines. These could be far- reaching and imaginative, in which case all the quoted government activities could be put to use. However the converse could also be true for those countries which do not have the resources or, have a vested interest in not pursuing cooperation. In developing an effective national policy it will be necessary to involve NGO, media etc. A new institution is probably NOT needed; this statement will require review. The resolution of issues will have to come from within, and between, individual countries. Data gathering, analysis and dissemination of information could be done by UNEP, UNESCO, UNHCR etc. as appropriate. The role of the Security Council could be similar to that used in authorizing peacekeeping missions.

Environmental security should be part of all ministries and organizations, although during the initial steps the existence of a dedicated organization would be beneficial to act like an "engine" for the implementation of environmental security.

Government should assume the responsibility of protection of public resources and environments.

Briefly, I suppose that our hope is looking for new kind of governance through reformed UN and adopted Global Marshall Plan. At the national level, the Ministry of the Environment should not be light weight any more and understood as ministry for environment and sustainable development with the same importance and significance as the Ministry of Finance, for example.

Scarcity of renewable resources like water and land tend to be local and or regional issues that need local and or regional solutions. The regional actions could benefit from global support (through broadened GEF for example, e.g. "white revolution" increasing water efficiency or second "Green Revolution" optimizing farming systems).

***2. Collecting, analyzing and sharing information about the environment is important in several ways: first, it can help establish when and if environmental security is threatened. Second it can help policy makers develop informed policies. Finally, sharing of information among nations is a positive way to cooperate.***

The provision of common defense against environmental threats can best be achieved by interested parties knowing what is proposed throughout their region. Early consultation and transparency of proposals will help to reduce the potential for conflict. The sharing of information will be one of the best ways for governments to cooperate. However there will always be commercial and/or private elements which cannot necessarily be counted on to cooperate. This situation will probably require national measures and legislation based on some form of international agreement.

Where appropriate, intelligence information, particularly archival information may be used to provide additional environmental data for analyses. Some of this is already underway in several nations.

In the context of this study, one area of focus for assistance should be capacity building for environmental security. One specific example is improved capacity for environmental monitoring.

A key area is to improve the quality of environmental information (especially national and regional data sets) and education.....This should be funded by advanced industrial states, perhaps through the GEF to support information and education in developing and transition states. UNEP should play a role in upgrading data set standards, making information available, and supporting environmental education. In advanced industrial states, emphasis needs to be placed on integrating environmental education into the curriculum at all levels, beginning with first grade.

New electronic media, such as Internet will play increasingly important roles in terms of promoting awareness and communication.

### ***3. Several strategies were suggested for improving environmental security in developing countries.***

One of the biggest contributions the developed world can make towards environmental security at all levels is through strengthened commitment to foreign assistance and technology transfer to the developing world.

Countries with weaker capacities to participate in international agreements need to be technically strengthened so that they are equal players at the table. In particular, countries need the technical capacity to reliably assess resource needs and, by environmental monitoring, the extent to which they are being met. Technical capacity to monitor and deal with environmental change more proactively should be substituted for resorting to conflict.

Local and regional issues need local and regional solutions - concerted regional actions with possible global support (through broadened GEF for example, e.g. "white revolution" increasing water efficiency, 2nd Green Revolution optimizing farming systems).

### ***4. The private sector is important but its role is controversial.***

When the private sector views environment or conservation as good for business, it will play a critical role. Most MNCs in Africa sponsor numerous conservation projects or game parks because it is viewed as good PR. However, this does not necessarily stop these companies from engaging in environmentally destructive production practices. The fundamental link between short-term economic costs and medium-long term environmental costs will have to be made. The driving force for this must come from changes in consumer demand and will also require new mandatory regulations by national governments (and international regulation accepted by key nation-states) before there will be meaningful changes in major business practices in any sector (e.g., shift from combustion engine to newer technologies by car industry; shift from fossil fuels to cleaner forms by energy corporations).

The private sector can play a critical role in increasing awareness and implementing new practices in developing countries. For example, South Africa viewed emission trading credits as a major priority, because potential foreign investors wanted to know what the country's policy was and this issue was linked to the immediate priorities of increasing foreign investments and job creation. Thus, global and national regulatory policies and treaties can often be enforced most effectively through private sector business practices. The bottom line is that corporations must be convinced that these changes are necessary either to continue operating, to increase short-term profits, or longer-term market shares.

Incentives need to be further developed and promoted for private commercial sector involvement, as is being pursued with regards to climate change. And, bilateral and multilateral assistance should be maintained at current levels, or even increased.

**5. *Other organizations and media may also have responsibilities.***

NGOs can play useful roles as stakeholders and lobbying groups. The land mines treaty and current efforts related to lobbying for global conventions on small arms agreements illustrate the power of groups in addition to their usefulness as providers of technical aid and advisers. NGOs are also increasingly important as contractors for regional IGOs in developing areas. (i.e., first regional report on state of environment in Southern Africa written by ICUM).... Media can play key roles but commercial stations will continue to reflect mainstream controversies, so coverage will be determined by actions of government, business, IGOs, NGOs, and spontaneous movements. Public access stations could also play a huge role in shaping debates, as could public radio stations.

Awareness is needed in the industrialized world of the way personal consumption contributes substantially to the consumption of living and non-living resources, and the production of wastes. Information should be provided that not only makes consumers aware of the consequences of their decisions but also offers options which will lessen the impacts of consumption. A coordinated commitment is required from international, national, and local agencies, including governments, NGO's, researchers, media religious groups and political groups.

Research by academic institutes with findings spread by mass media will help people understand the mechanisms, and responsibilities associated with environment security, and mobilize the masses to form ideologies to take care of the environment.

Promote national, regional and global dialogue on environmental issues. Environmental issues should be included on all agenda such as WTO discussions, G7 discussions, regional security discussions, etc. Leadership should come from a variety of sites, including advanced industrial states, NGOs, and international organizations. Good models include the Woodrow Wilson Center in Washington which encourages interagency dialogue on environmental security, NATO's Advanced Research Workshops which allow experts from NATO and non NATO countries to meet to discuss these topics, and the meetings on regional security and environmental change organized by the Asia Pacific Center for Security Studies in Hawaii.

**6. *Many international treaties and agreements relating to environmental security are in place; more may be needed. New policy suggestions should be built on knowledge of existing treaties and agreements.***

Of course, international treaties are needed. The improvements in treaties should be continuous in order to effectively address current challenges.

Consider all of the international environmental treaties, conventions and protocols under the UN. Some that spring to mind are transboundary pollution (acid rain), endangered species (CITES), desertification, London dumping convention (ocean pollution).

Signatories to the various statements of intent emerging from the 1992 Rio Conference should

make a genuine and concerted effort to implement these provisions. There is no need to reinvent policy; enacting what has already been widely agreed upon in principle would make massive inroads into the problem of environmental insecurity.

IGOs (International Government Organizations) can play a useful role in promoting global and regional treaties and norms but these agreements must be supported by major nation-states in both the developed and developing world.

Where possible, strengthen or refine existing policies, treaties, structures, and organizations, instead creating new ones. Greater clarity and definition of the roles and responsibilities of existing transboundary institutions is needed. Bilateral commissions and authorities operating within larger river basins may need to broaden into multilateral institutions to achieve greater harmony of national policies/laws across all countries in a basin. Harmonization of national or sub-national policies/laws with international protocols may be a key initiative towards environmental security. Harmonization will assume greater criticality as countries decentralize policy-making and implementation.

***7. The question of enforcement remains: what teeth do existing organizations and treaties have? Must military organizations enforce the treaties and under what circumstances?***

There obviously needs to be strengthened provisions related to reporting and transparency by nation-states, verification by third parties, and enforcement.

An international organization should be empowered to protect natural resources in situations where countries openly defy international conventions (e.g. Japan and Norway's ongoing whaling activities). Such an organization (whether a newly created one, or something stemming from existing organizations) needs to have the teeth to effectively enforce these agreements.

***8. Two people argued against creating general policies for environmental security:***

There is a need for security policy reform, in light of the changing nature of security threats and the changing opportunities for coping with them. And there is a need for environmental policy reform, in light of the mismatch between existing global management capacity and likely threats to environmental resources. But it does not follow that there is any need for environmental security policy per se. It is possible that attempts to fashion environmental security policy will diminish the prospects for effective reform of security and environmental policy.

....Signatories to the various statements of intent emerging from the 1992 Rio Conference should make a genuine and concerted effort to implement these provisions. There is in this sense no need to reinvent policy, enacting what has already been widely agreed upon in principle would make massive inroads into the problem of environmental insecurity. The UN agencies should lead, but implementation now initially requires all levels and all divisions within national bureaucracies to instigate reform.

***9. In some instances environmental security was seen as a military matter. Several sorts of missions were envisioned. One was the use of force to protect a nation's interests that are challenged by environmental changes. Another is the protection of the environment from the damage that the military itself may cause. A third is the role of the military in safeguarding natural resources.***

Environmental security should be considered as an organic part of the total defensive capability of a country. This will require a detailed analysis of the possible dangers, and the strategic response of preparative and preventive measures...

Many environmental issues impact quality of life, military training, and operations of military facilities. More recently, though, DOD has begun to recognize the linkage between environmental degradation and regional stability throughout the world...Today we are proud that we are fully integrating environmental protection into the military mission...

We must conduct our military operations in a manner protective of the environment.... Such is the challenge of environmental security.

Various agencies of the US Government use the concept of environmental security, including the CIA, Defense Intelligence, Department of Defense, Department of State, and the EPA. There is no official definition that unifies thinking and action related to environmental security; rather, each group has developed its own understanding.

Thus the CIA and Defense tend to stress the relationship between environmental change and conflict and instability. Sherri Goodman, Deputy Undersecretary of Defense for Environmental Security has related the concept to former Secretary of Defense William Perry's notion of "preventive defense" According to Goodman, Defense's objective is to "understand where and under what circumstances environmental degradation and scarcity may contribute to instability and conflict, and to address those conditions early enough to make a difference." (August 8, 1996 speech)

In contrast, DIA is concerned more with environmental threats to military personnel stationed abroad. Its focus is on water quality, infectious disease and so on...

The provision of common defense against environmental threats can best be achieved by interested parties knowing what is proposed throughout their region. Early consultation and transparency of proposals will help to reduce the potential for conflict. The sharing of information will be one of the best ways for governments to cooperate. However there will always be a commercial and/or private element which cannot necessarily be counted on to cooperate. This situation will probably require national measures/legislation based on some form of international agreement/treaty/arrangement.



**GENERAL POLICY COMMENTS TO IMPROVE ENVIRONMENTAL SECURITY**

A coordinated effort to educate the world about the environmental impacts of consumption is needed from international, national, and local agencies both formal and informal, including governments, NGO's, researchers, media, and religious and political groups. In addition to making consumers aware the consequences of their decisions, the educational effort should also offer options which will lessen the impacts of consumption.

Promote national, regional and global dialogues on environmental issues. Environmental issues should be included on all agenda such as WTO discussions, G-8 discussions, regional security discussions etc. Advanced industrial states should lead with some assistance from , NGOs, and international organizations. Good models include the Woodrow Wilson Center in Washington which encourages interagency dialogue on environmental security, NATO's Advanced Research Workshops which allow experts from NATO and non NATO countries to meet to discuss these topics, and the meetings on regional security and environmental change organized by the Asia Pacific Center for Security Studies in Hawaii.

Sustainable development is a key aspect of the condition of environmental security and should be promoted through a variety of mechanisms including education, steering national economies with tax and subsidy programs, promoting green technology innovation, diffusion and implementation, and strengthening multilateral environmental agreements (MEAs). In particular, it is important for a coalition of political elites, non-state actors and representatives of IOs to study the effectiveness of MEAs and determine ways in which compliance can be improved and standards can be strengthened.

Countries with weaker capacity to participate in international agreements need to be technically strengthened so that they are equal players at the table. In particular, countries need the technical capacity to reliably assess resource needs and, by environmental monitoring, the extent to which they are being met. Technical capacity to monitor and deal with environmental change more proactively should be substituted for resorting to conflict. Following this observation is the suggestion that one of the biggest contributions the developed world can make towards environmental security at all levels is through strengthened commitment to foreign assistance and technology transfer to the developing world. Incentives need to be further developed and promoted for private commercial sector involvement - as is being pursued with regards to climate change. And, bilateral and multilateral assistance should be maintained at current levels, or - preferably - increased. In the context of this study, one area of focus for assistance should be capacity building for environmental security - one specific example is improved capacity for environmental monitoring.

Perhaps what is more needed is not so much a definition of environmental security, but an effort to turn the inward focus of the U.S. back outwards. Policy makers should more forcefully and convincingly be made aware of the links between U.S. interests (inclusive of environmental security) and environmental security elsewhere (again, down to the individual/household level) - without enmeshing the effort in jargon. And, again, the effort does need to focus in part on households, communities (often not visible in national security dialogues) - higher level

environmental security not built on a foundation of security at these levels is shaky at best.

Establishing a definition for environmental security is necessary before setting policy and institutional responsibilities. In the mean time, aligning environmental perturbations with environmental security is inappropriate. Perhaps the best approach would be to take a case study – the use of CFCs to manufacture and maintain weapons systems might be a good one – and look at how the institutional structure evolved in many directions to manage that challenge. Then see if the template derived from that exercise offers any insight on future institutional evolution.

## Appendices

1. Questionnaire—Round 1
2. Questionnaire—Round 2
3. The Environment as a Security Issue
4. Bibliography

### 1. Questionnaire—Round 1

#### **Environmental Security Study - Round 1 Invitation**

[The layout of this questionnaire was modified for this CD-ROM version]

21 January 1998

The Millennium Project of the American Council for the United Nations University in cooperation with the Smithsonian Institution and the Futures Group has the honor to invite you to participate in an international panel on “Environmental Security.” Background on the Project is available at <http://millennium-project.org>.

The purpose of this international panel is to identify and judge definitions of environmental security, provide judgements about policies to address elements of these definitions, and help define responsibilities for implementing the policies. Former U.S. Secretary of State Warren Christopher said in April 1996 that, “As we move to the 21st century, the nexus between security and the environment will become even more apparent.” Unfortunately, there is little clarity about the nature of this nexus, the policies to address it, and responsibility for leadership in this area. Further this is not simply an issue for some nations, but all nations.

In addition to the use of the Project’s results in education and advanced training, it is the Project’s intention that this work be provided to decision makers to add focus to important issues, clarify choices, and present a range of views on policy.

The first round of the Environmental Security Questionnaire poses the questions: How should environmental security be defined, what are potential threats to environmental security, what polices should address this issue, and who should provide the leadership?

If you decide to participate, please complete and return the attached questionnaire by 18 February 1997. Respond by e-mail to: [jglenn@igc.org](mailto:jglenn@igc.org) or fax to 202-686-5179 or air mail to: AC/UNU Millennium Project, 4421 Garrison Street, N.W., Washington, DC 20016 USA. We prefer that you respond by email so that no errors are made when reading your comments. Simply type the question numbers and your responses - you need not re-type the questions. The results will be sent to you as part of a second and final

round within two months. Results of the second round will also be sent to you. As in other studies of this sort, the final report will include the list of participants, but will not associate any particular answer with an individual - your views will be kept confidential. If you have any questions please contact us at anytime. We look forward to your responses.

Sincerely yours,

Theodore J. Gordon and Jerome C. Glenn  
AC/UNU Millennium Project Co-directors

## **ENVIRONMENTAL SECURITY**

### **ROUND 1 QUESTIONNAIRE**

1. Does your country's Ministry of Defense or Environmental Agency have a definition of Environmental Security? If so, please include either or both official or working definitions below or as an attachment. If necessary, we will translate.

Yes    No    Currently creating one    I do not know

2. Please rate the following working definitions of environmental security. For the purpose of this study a "useful" definition is one that is precise and can be used as the basis for forming policy. Please use the following scale to rate the definitions:

- 1 = Excellent. Should be used as the definition.
- 2 = Extremely useful. With some modification could be used as a definition.
- 3 = Very useful, but needs elements of others to make it more complete and useful
- 4 = Useful but incomplete. It could be used to add to other definitions
- 5 = Not useful. Misleads the policy discussion

Also edit and/or comment on the definitions provided below and submit your own definition or quotations of other definitions at the end of this section in the space provided.

2.1 Environmental security is the relative public safety from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement or design and originating within or across national borders.    Usefulness \_\_\_\_    Comments:

2.2 Environmental security is the state of human-environment dynamics that includes restoration of the environment damaged by military actions, and amelioration of resource scarcities, environmental degradation, and biological threats that could lead to social disorder and conflict.

Usefulness \_\_\_\_

Comments:

2.3 Environmental security is the cycling of natural resources to products, to wastes, to natural resources in ways that promote social stability. Usefulness \_\_\_\_ Comments:

2.4 Environmental security is the maintenance of the physical surroundings of society for its needs without diminishing the natural stock. Usefulness \_\_\_\_ Comments:

2.5 Environmental security is the freedom from social instability due to environmental degradation.

Usefulness \_\_\_\_ Comments:

Please add your own definition or quotations of other definitions:

3. Examples of current or previous threats to environmental security:

	By Ignorance and/or Mismanagement	By Intention	Mix of Natural and Human Action
Within a Country	C.1 Oil spills in Ogoniland Nigeria Aral Sea depletion in Russia Indonesian fires Ground water contamination Hazardous wastes	C.2 Sirin gas attack in Tokyo subway  Chemical attacks in Iraq	C.3 Floods Famines Salinization
Trans-border	C.4 Rain forest depletion River usage in (Jordan, Nile, Tigris, Euphrates) Chernobyl Nuclear Accident Diminishing Biodiversity Ozone depletion	C.5 Burning oil fields in Kuwait	C.6 Solar radiation changes Global Warming AIDS

Please add future or potential threats below using the cell number (C.#) from the table above. For example, poisoning a water system would be listed in C.2 (as a threat by intention within a country); a comet hitting the earth would be listed in C.6 (as a threat from natural process with a transborder effect).

Potential threats to environmental security:

3.1

3.2

3.3

3.4

4. Considering the definitions in Section 1 and examples in Section 2, what are the general policies that should be adopted? And who should lead the policy - government (when should leadership come from ministries or departments of defense, state or foreign affairs intelligence, environment, or other government organizations), international organizations (when should leadership come from organizations such as UNEP, IAEA, National Security Council, etc.), NGOs, media, or the private sector? Or is this such a complex global issue that a new kind of institution or organization has to be created to properly provide the leadership?

In addition to the current international environmental treaties, conventions and protocols under the UN, such as transboundary pollution (acid rain), endangered species (CITES), desertification, London dumping convention (ocean pollution), how should governments, international organizations and others provide common defense against environmental threats? Or if current treaties, conventions and protocols adequately address the issues, but need improved monitoring and enforcement, then what policies and leadership should make those changes?

POLICY	LEADERSHIP
4.1	
4.2	

You are welcome to attach more if you like.

If you have additional perceptions or comments that should be taken into consideration on this

issue please provide them below. For example: “Unlike conventional military security, providing for environmental security has the potential to increase global cooperation; and hence, could be a deterrence to other forms of warfare.”

This completes Round 1. Please return this questionnaire by 18 February 1998.  
Thank you for our participation.

## 2. Questionnaire of Round 2

### ENVIRONMENTAL SECURITY - ROUND 2

June 9, 1998

1. Does your country’s Ministry of Defense or Environmental Agency have a definition of Environmental Security? If so, please send it to the Millennium Project at the address above. Include either or both official or working definitions. If necessary, we will translate. You do not need to answer again if you have already answered this question in the Round 1 questionnaire.

Yes     No     Currently creating one     I do not know

2. What do you expect to be the one or two most important environmental security threats within the next ten years?

3. A list of current, previous, and possible future threats are listed on pages 2-8. Please identify what institutional sector in the table below should have the primary policy leadership to address each treat. Please put the sector’s number in the space provided before the threat.

- 1 = International Organizations (UN, UN organizations and affiliated institutions, and regional bodies like NATO and OAS).
- 2 = National Government’s Military Organizations
- 3 = National Government’s Civilian Agencies
- 4 = National Government’s Intelligence Agencies
- 5 = Corporations, Private Sector
- 6 = NGOs
- 7 = Not clear who has the lead-responsibility
- 8 = Others specify

### **C1** *Within a Country, By Ignorance and/or Mismanagement*

#### **Current or previous threats**

- \_\_\_ Oil spills in Ogoniland Nigeria
- \_\_\_ Aral Sea depletion in Russia
- \_\_\_ Indonesian fires
- \_\_\_ Ground water contamination
- \_\_\_ Hazardous wastes

**Future threats**

- \_\_\_ Particulate emission in power plants and factories
- \_\_\_ Over fishing, and environmentally irresponsible fishing techniques including bottom trawling, long-lining, use of fine-mesh nets, muro ami, and dynamite fishing
- \_\_\_ Extraction and transport of oil and other resources in environmentally sensitive areas
- \_\_\_ Transportation of alien species into new ecosystems
- \_\_\_ Chemicalisation of sources and sinks causing depletion of human health and reproductive capacity
- \_\_\_ Water scarcity (especially in the Middle East, parts of Africa and China)
- \_\_\_ Soil erosion (worldwide problem)
- \_\_\_ Disease epidemics (eg cholera in Peru 1991)
- \_\_\_ Old growth forests depletion
- \_\_\_ Radioactive waste management; underground nuclear waste storage tanks
- \_\_\_ Solid waste
- \_\_\_ Urban oil burning power plants
- \_\_\_ Disposal of hazardous/toxic wastes
- \_\_\_ Increasing and intensive using of chemical fertilizer, pesticide and detergents.
- \_\_\_ Depletion/Damming of internal rivers causing ecological change
- \_\_\_ Contamination of soil through spills or leakage of solid/liquids requiring remediation



- \_\_\_ Low effective exploitation of mineral resource scattering in village and local level with primary technology; without or lack of effective official management.
- \_\_\_ Over consumption trends around the world
- \_\_\_ Settlement/development or encroachment onto hazardous environments such as riverine and coastal flood plains, earthquake-prone and volcanically active zones.
- \_\_\_ Settlement/development/misuse of sensitive/hazardous or unsustainable development environments such as marginal grasslands/arid environments.
- \_\_\_ Settlement/development/misuse of ecologically sensitive zones such as certain forest, desert, wetland and marine environments.
- \_\_\_ Diversion/misuse of water resources such as diversion of water courses to agricultural or urban areas at the expense of draining environmentally sensitive wetlands.

## **C2 *Within a Country, By Intention***

### **Current or previous threats**

- \_\_\_ Sirin gas attack in Tokyo subway
- \_\_\_ Chemical attacks in Iraq

### **Future threats**

- \_\_\_ Draining of southern marshes in Iraq
- \_\_\_ Use of specialized equipment by some bottom trawlers which is specifically designed to “condition” the sea floor by leveling rock formations and coral heads which serve as critical habit for local species
- \_\_\_ Poisoning water resources (groundwater and surface water)
- \_\_\_ Rapid development of rural industrial development in China, some of them are heavily polluted industries taking the strategies of “Pollution first, treatment followed”.
- \_\_\_ Soil erosion due to increasing population demand for food.
- \_\_\_ Diversion/misuse of water resources such as diversion of water courses to agricultural or urban areas at the expense of draining environmentally sensitive wetlands

## **C3 *Within a Country, Mix of Natural and Human Action***

[One respondent’s comment was that C3 are really the same as C6]

**Current or previous threats**

- \_\_\_ Floods
- \_\_\_ Famines
- \_\_\_ Salinization

**Future threats**

- \_\_\_ The Indonesian fires were not solely an in-country threat to environmental security - neighboring countries like Malaysia and Singapore were strongly affected
- \_\_\_ Transport of species/introduction of non-native species.
- \_\_\_ Fishery depletion
- \_\_\_ Earthquakes disasters
- \_\_\_ Falling river flows and even stopping (e.g., lower reach of the Yellow River in China)
- \_\_\_ Earthquakes
- \_\_\_ Settlement/development/misuse of sensitive/hazardous or unsustainable development environments such as marginal grasslands/arid environments.
- \_\_\_ Settlement/development or encroachment onto hazardous environments such as riverine and coastal flood plains, earthquake-prone and volcanically active zones.
- \_\_\_ Settlement/development/misuse of ecologically sensitive zones such as certain forest, desert, wetland and marine environments.

**C4 *Trans-border, By Ignorance and/or Mismanagement*****Current or previous threats**

- \_\_\_ Rain forest depletion
- \_\_\_ River usage in (Jordan, Nile, Tigris, Euphrates)
- \_\_\_ Chernobyl Nuclear Accident
- \_\_\_ Diminishing Biodiversity
- \_\_\_ Ozone depletion

**Future threats**

- \_\_\_ Depletion of Fisheries
- \_\_\_ Extraction and transport of oil and other resources in environmentally sensitive areas
- \_\_\_ Transportation of alien species into new ecosystems
- \_\_\_ Chemicalisation of sources and sinks causing depletion of human health and reproductive capacity
- \_\_\_ Ozone layer depletion
- \_\_\_ Global climate change due to greenhouse gases
- \_\_\_ Air pollution and acid rain in newly industrialized countries using old technologies (China, India, Brazil, South Africa)
- \_\_\_ Poverty
- \_\_\_ Low radiation from accidents occurring in old nuclear power-plants
- \_\_\_ Spills from stockpiles of “old weapons”
- \_\_\_ Radioactive waste management
- \_\_\_ Disposal of chemical and biological wastes
- \_\_\_ Water competition and dam construction
- \_\_\_ The huge amount of coal burning in China (around 800 million tons of coals directly burned annually)
- \_\_\_ Over fishing of threatened species e.g. Southern Bluefin Tuna and Patagonia Tooth Fish
- \_\_\_ Environmental impacts of mismanaged human migrations.
- \_\_\_ Scarcity of fossil energy (oil/gas), other scarce sources
- \_\_\_ Settlement/development/misuse of sensitive/hazardous or unsustainable development environments such as marginal grasslands/arid environments.
- \_\_\_ Settlement/development or encroachment onto hazardous environments such as riverine and coastal flood plains, earthquake-prone and volcanically active zones.
- \_\_\_ Diversion/misuse of water resources such as diversion of water courses to agricultural or urban areas at the expense of draining environmentally sensitive wetlands.

- \_\_\_ Settlement/development/misuse of ecologically sensitive zones such as certain forest, desert, wetland and marine environments.

### ***C5 Trans-border, by Intention***

#### **Current or previous threats**

- \_\_\_ Burning oil fields in Kuwait

#### **Future threats**

- \_\_\_ Poisoning water resources (groundwater and surface water)
- \_\_\_ River usage/control (see C4 , add Brahmaputra, etc). Dam construction in Turkey-Iraq (competition for water), in N. Korea-S Korea. Diversion/misuse of water resources such as diversion of water courses to agricultural or urban areas at the expense of draining environmentally sensitive wetlands.
- \_\_\_ Use of specialized equipment by some bottom trawlers which is specifically designed to “condition” the sea floor by leveling rock formations and coral heads which serve as critical habit for local species

### ***C6 Trans-border, Mix of Natural and Human Action***

#### **Current or previous threats**

- \_\_\_ Solar radiation changes
- \_\_\_ Global Warming
- \_\_\_ AIDS

#### **Future threats**

- \_\_\_ Emerging diseases
- \_\_\_ Spread of drug resistant infectious disease
- \_\_\_ Ice storm disaster in Quebec and eastern Ontario
- \_\_\_ Human population growth
- \_\_\_ Poverty and the widening gap between “ rich and poor”

- \_\_\_ Increasing spiritual disconnectedness from Nature
- \_\_\_ Big fires that are occurring , more and more frequently in the rain forest (Indonesia, Australia, Amazonia) and Mediterranean countries
- \_\_\_ Desertification
- \_\_\_ Infectious disease of plants and animals
- \_\_\_ Settlement/development/misuse of sensitive/hazardous or unsustainable development environments such as marginal grasslands/arid environments.
- \_\_\_ Settlement/development or encroachment onto hazardous environments such as riverine and coastal flood plains, earthquake-prone and volcanically active zones.
- \_\_\_ Settlement/development/misuse of ecologically sensitive zones such as certain forest, desert, wetland and marine environments.

**Additional comments are most welcome:**

Thank you for your participation. Please send fax to the Millennium Project at 202-686-5179 or mail to AC/UNU Millennium Project, 4421 Garrison Street, N.W., Washington, D.C. 20016.

### 3. The Environment as a Security Issue

COMMISSIONED PAPER BY DR. RENAT PERELET, INSTITUTE FOR SYSTEMS ANALYSIS,  
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#### INTRODUCTION

Environmental security (ES) becomes a key objective in long-range environmental policy. The disturbing rate of global environmental change, on the one hand, and the signs of exceeding the earth's system limits by humankind, on the other, are now increasingly considered in terms of human security and viewed much more urgent and important a future challenge than the issue of war and peace, especially at the end of the cold war. This view has been widely shared, including the developing nations since the late 1980s-early 1990s. (Enhancing the Economic Role of the United Nations. South Center, Oct.1992; Bjorkbon, L. et als. 1992; Soroos,M. 1989; Young.,O. 1989).

The central idea of defining the environment in terms of security is to help move it to the top of the priority list of political actors (Lodgaard, Sverre, 1990. 'Environmental Conflict Resolution', paper presented at the UNEP meeting on 'Environmental Conflict Resolution', Nairobi, 30 March.). Negatively affected ecosystems with their boundaries not corresponding to political boundaries between states lead to international tensions and conflicts because of trans-boundary pollution transfer or shared environmental resource situations.

For the first time in history, humans are upsetting the very life support systems of the planet. The resultant changes will disrupt living conditions and economies and, consequently, provoke conflict. And if these changes are not arrested, or at least managed satisfactorily, they will have profound and probably irreversible consequences that will the security of nations (Mansfield, William H., III, 1992. 'Editorial', *Our Planet*, vol.4, p.2).

In discussing the notion of environmental security, several related issues are to be considered such as its relationship with conventional military security which immediately comes to mind when any notion of security is treated, whether military security leads to environmental security concern, or it is becoming obsolete and environmental security substitutes it or complement. Furthermore, the issues of environmental security and its relationship with national, international and global security involve the consideration of such notions as threats, **risks, vulnerability, and regional stability**. Furthermore, environmental security is usually considered to be different from the security of the environment, the latter being closer to the notion of environmental protection.

#### THE MILITARY SECURITY AND THE ENVIRONMENT

The preoccupation with military **security** in both developed ('capitalist' and 'socialist') during the 'Cold war' period and developing countries used to overshadow other security dimensions. In addition, military capacity seemed to be paramount to protect identity and territorial integrity of nation-states.

The break-up of the USSR and the Eastern military block as well as the ensuing end of the Cold War removed threats of a global nuclear war and the need in expensive preparatory military activity involving the military use of technological change as well as natural, intellectual and labor resources. However, the recent upsurge of local military conflicts, often related to ethnic and religious disputes (such as in Yugoslavia or in Russia over the Chechen area), have brought severe local environmental degradation from the use of conventional as well as environmental 'weapons' (e.g., burning oil wells in the Gulf war, blowing up a dam in the conflict in Moldavia) with long-term consequences. Interestingly enough, the withdrawal of Russia from the huge armaments market (Russia and the USA were the two dominant and competing powers in it for a long time) and the ensuing reduction of its volume has not led to fewer violent international or intranational conflicts or to lessening international terrorism.

The so-called non-allied nations defying the then world's dichotomy developed they're own military capability, still largely using weapons supplied by countries from the two blocks. The recent nuclear weaponry tests by India and Pakistan echo the ideology of that period.

A Third World war scenarios on which military security policies used to be based have been replaced by the more realistic possibility of proliferating regional conflicts and terrorist attacks which has become the justification of the military forces and military security. It is also argued that the military may be needed of the military to quell environment-related tension. It may be necessary to use military means to prevent the destruction of the rain forests. Thus, **the securization of the environment** may help perpetuate the historical practice of justifying the use of force by referring to seemingly objective needs. (Brock, Lothar. (Peace Research Institute Frankfurt, Germany). The environment and security: conceptual and theoretical issues in book "Conflict and the Environment". Ed.by N.P.Gleditsch in collaboration with L.Brock, T.Homer-Dixon, R.Perelet, E. Vlachos. Kluwer Academic Publishers, p.20).

Sometimes, concern is expressed over environmental threats to military personnel stationed abroad. Its focus on water quality, infectious disease and so on (R. Matthew, Feb. 11). The US Department of Defense argues that they are fully integrating environmental protection into the military mission: from the top generals to the newest privates, the military automatically consider the environment in making their decisions. Militaries can use their technical capabilities, infrastructure, and management ability to achieve environmental goals; this reduces their impact on the environment. (Remarks for Sherri Goodman at the Woodrow Wilson Center Meeting, May 9, 1997.)

**Box 1****CLINTON TELLS CADETS BE READY FOR BIOLOGICAL ATTACK**

US President Bill Clinton told graduating cadets at the Naval Academy on May 22, 1998 that the availability of biological agents and advances in biotechnology mean that the United States must be prepared for an attack involving biological weapons against armed forces or civilians.

The President outlined four critical areas of focus:

First, if terrorists release bacteria or viruses to harm Americans, we must be able to identify the pathogens with speed and certainty. The new plan will seek to improve public health and medical surveillance systems so the alarm can be sounded fast. These improvements will benefit preparedness for a biological weapons attack, and will pay off in an enhanced ability to respond quickly and effectively to outbreaks of emerging infectious diseases.

Second, emergency response personnel must have the training and equipment to do their jobs. Building on current programs, President Clinton's plan will ensure that federal, state and local authorities have the resources and the knowledge they need to deal with a crisis.

Third, medicines and vaccines are needed to treat those who fall sick or prevent those at risk from falling ill because of a biological weapons attack. President Clinton will propose the creation of an unprecedented civilian medical stockpile. The choice of medicines and vaccines to be stockpiled will be made on the basis of the pathogens that are most likely to be in the hands of terrorists or hostile powers.

Fourth, the revolution in biotechnology offers enormous possibilities for combating biological weapons. President Clinton's plan will set out a coordinated research and development effort to use the advances in genetic engineering and biotechnology to create the next generation of medicines, vaccines and diagnostic tools for use against these weapons.

An additional \$1 billion for chemical and biological defense have been added to the Five-Year Defense Plan, the President said.

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Military security, being in principle an environmentally unsound activity if only because it uses natural resources and human labor for non-productive activities (a kind of overheads for the national economy) and tempts to use the environment for military purposes, including environmental warfare. International efforts, such as the Enmod convention, the ban on nuclear testing in the air, water and on the ground were made to protect the environment from the most acute military related destruction.



Many of these intentional activities against or using the environment to achieve superiority over the adversary as well as prospective eco-terrorism are not covered by current international conventions and need to be duly and urgently addressed.

The military **to civil activity conversion** has led to prevailing peace ‘penalties’ instead of immediate dividends because the **destruction of weapons** and huge military stockpiles requires special technologies which need to be designed and which should be environmentally sound. They should usually deal with dangerous chemical substances. In addition, concern is expressed over environmental problems which may result from the erosion of bombs disposed of in the Baltic, the North, the White seas after World War II, the remnants of the Soviet submarine ‘Komsomolets’ sunk in the sea of Barents, etc. Thus, military threats are usually the result of intentional measures or neglect of future unthought-through consequence.

### **ENVIRONMENTAL THREATS**

However, the security of individuals, communities, nation-states, and the global community as a whole is increasingly jeopardized because of unpremeditated environmental, non-military, threats. These threats are seen to be exacerbated within the coming decades and should be addressed collectively or through globally agreed upon efforts. Their settlement could be effected peacefully through enhanced negotiation mechanisms, technological change, legal instruments, economic measures, and safeguarded by the availability of fast response international military forces to nip any violence in the bud, including international ecoterrorism as it starts.

Otherwise, environmental threats give rise to military forms of their resolution in search of gaining superiority over traditionally viewed enemies while 'the enemy' can be out of reach spatially (in the case of acid depositions) and time-wise (e.g., carbon dioxide released by J.Watt's first steam engine - "the enemy" - is still in the atmosphere contributing to climate change). Along with economic security issues, often coupled with military ones, human **security** appeared prominent after the World War II and that led to the colonial system breakup and later, especially with the CSCE-Amnesty International efforts, to the global human rights concern. Similar to military security, certain levels of human rights were achieved nationally and inter-country disparity in human rights leveled out.

### **ENVIRONMENTAL SCARCITY PROBLEMS AND CONFLICT**

The UNEP's former executive director M.Tolba stressed in 1990 that the international diplomacy of the next 50 years would be locked into the chaos and disruption created by the wasting of the natural foundation of the global economy. He argued that ‘the great danger is that we will not see the environmental dimensions behind the new conflicts’ and maintained that without global cooperation and financial commitment, escalating environmental tensions can trigger 21st century eco-wars (Tolba, M., 1990). However, security erosion already takes place even without open social intra- and international conflicts.

Environmental factors are densely intertwined with political, economic, social, and cultural factors, so that there are very few, if any, conflicts that could be strictly defined as environmental conflicts. (Brock, L, 1997,p.22).

It is often argued that scarcity of natural or environmental resources leads to conflicts (see Box 1). The role of environmental degradation and scarcity in causing conflict is the subject of lively debate in the US Department of Defense. Despite the lack of consensus about these issues, it is viewed that resource abuse and rocketed conditions such as high population growth rates, urbanization and migration, and the spread of infectious diseases may contribute significantly to instability around the world. (Remarks for Sherri Goodman at the Woodrow Center Meeting, May 9, 1997)

**Box 2. Water scarcity may lead to violent conflicts**

Dwindling water resources could threaten sustainable development and world peace as the French President Jacques Chirac warned at the international conference on Water and Sustainable Development hosted by the French government at the United Nations Education, Scientific and Cultural (UNESCO) Headquarters in March 1998. The organizations Director-General Federico Mayor and President Chirac, told delegates that without immediate international co-operation to solve water problems, water wars could break out.

Speaking to government ministers from 80 countries, officials from international, local and non-governmental organizations, business leaders and scientists, Mayor cautioned that over-use, due to population growth, waste and pollution are turning water into a scarce resource. "As it becomes increasingly rare, it becomes coveted, capable of unleashing conflicts. More than petrol or land, it is over water that the most bitter conflicts of the near future may be fought," Mayor said.

Highlighting the activities of UNESCO in the field, dating back to the early 1950s, Mayor stressed that the approach of UNESCO's International Hydrological Programme to dealing with water resource problems is integrated, both qualitatively and quantitatively. It includes "beliefs, value systems, behavior, cultural habits - the interaction between water and what is generally referred to as civilization."

"Our management of water," he said, "is crucial to determining whether "the future will be that of war, whose culture we have been perpetuating for thousands of years, or of harmony among human beings, between humanity and nature, between humanity and the cosmos, which will testify to a giant stride towards maturity."

President Chirac urged immediate action, saying that water consumption is increasing twice as fast as the world's population - doubling every two decades. "At the turn of the century," Chirac said, "the amount of fresh water available to each inhabitant will be one quarter of what it was in 1950 in Africa, and one third of what it was in Asia and Latin America."

Like Mayor, President Chirac argued that the technical means to tackle this problem are available. "In these times of globalization, sustainable development consists of organizing, on a global scale, a common management of scarce resources," the French president said.

**Box 3**

From the speech given by Professor Dr Klaus Topfer, Federal Minister for the Environment, Nature Conservation and Nuclear Safety in his capacity as Chairman of the UN Commission on Sustainable Development (CSD) at the International Conference on Population and Development held in Cairo from 5 to 13 September 1994

"The menacing threat of water shortage, the alarming developments in global food production, combined with increased pollution and overuse of the soil resulting in shortages of agricultural areas, the shortage of energy resources and the possible results this will have on the climate as well as our growing mountains of waste: all these are also part of the complex challenge to be faced by each individual country and by the international community as a whole."

However, R. Lipschutz (University of California, USA) argues that it is not environmental resource (say, water) scarcity that leads to conflicts and possible wars as Malthus and Meadows promulgated but the distribution of resources, that is for whom would food and minerals be scarce? Scarcity is not a product of 'Nature' but, rather, a consequence of control, of ownership, of property, of sovereignty, of markets. Even properly functioning markets can foster maldistribution and relative scarcity. Scarcity is only relative in this instance, but some people (and countries) do go hungry and the invocation 'to free up' markets does little to address the immediate needs of those who have neither food nor money. Relative scarcity is also a condition of boundaries, in this instance political, cultural, or social ones. The resources must remain *sovereign property*. In other words, scarcity is a social construction that, as mentioned above, serves the commodification of nature. (R.Lipschutz (University of California, USA). Environmental Conflict and Environmental Determinism: The Relative Importance of Social and Natural Factors, p.44)

"It is this tension between territorial sovereignty and the sovereignty of Nature that sets up the basis for problems such as 'water wars' in the first place." (P.45)

The distribution of resources among states is uneven; a condition often blamed on Nature and geography, with the result that one state finds itself needing to interact with another. A water war is simply the international equivalent of an unjust 'taking' without the constitutional trappings. Creating open, trans-border markets in water will non-necessarily lead to 'water peace'. It could mean, instead, that the highest bidder wins the water and the losers get angry. For much of human history Nature was sovereign. Nature makes rules and humans were obliged to observe them or die. Sir Francis Bacon (1620): 'Nature, to be commanded, must be obeyed'. But humans escaped from that (first) Nature long ago. Of course, we do not control all geobiophysical processes that might be thrown at us. At some level we do share the same atmosphere, climate system, and hydrological cycle, but we remain separated by all kinds of boundaries, not the least of which is that demarcating power from weakness. (p.46). Thus, while the invocation of 'interdependence' as well as 'environment and conflict' as 'facts of Nature' are almost commonplace, they are virtually always judged as **a cost to us, to our sovereignty and autonomy**. Those who do want to alter their ways of doing things can call on national

sovereignty for protection; those who want others to change their ways of doing things can call on ecological interdependence. (p.47)

**The Bern group (Swiss Peace Research Foundation)** headed by Kurt Spillman and Guenter Baechler makes a distinction is made between economic and ecological scarcity. Economic scarcity refers to the quantity of a resource; ecological scarcity, to its quality. Whereas economic scarcity of relative, ecological scarcity may turn absolute to the degree that degradation leads to an irreversible destruction of resources. (L.Brock, 1997, p.23)

**The Toronto group (Homer-Dixon, et als)** includes in its definition of environmental scarcity 'structural scarcity', which is caused by an unbalanced distribution of resources that severely affects less powerful groups in society. So, it is here, too, it is not environmental scarcity as such that determines conflict behavior; rather, it co-functions with the distributive properties of societies.

L. Brock stresses that there is a dire need **to look into possibilities for striking a new balance between the commercial and the 'existential' use of natural resources and to distinguish between depletion - or scarcity - caused by commercial interests and by poverty.** Environmental conditions have to be seen in their political, social, economic, and cultural contexts.

## **SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL SECURITY**

The environment has so far been firmly established as a major priority issue in natural sciences and only **recently in social sciences**. It is on the government and international political agenda but has not yet been adequately placed on the security agenda, although some inroads were made in this direction.

The environment can now be considered as a security issue in view of increasingly unsustainable features of modern development. **Environmental security (ES) is seen as protection capability of societal systems (communities) to withstand threats of (1) environmental asset scarcity, (2) environmental risks or adverse changes, and (3) environment related tensions and conflicts.**

(R.Perelet (1994). The environment as a security issue. In book "The environment: towards a sustainable future. Ed. by Dutch committee for long-term environmental policy. Kluwer Academic Publishers). These components reflect major deepening conflicts between humans and the environment - (1) and (2) and among humans over the environment (3)).

They also reflect growing vulnerability of humans in front of (a) environmental stress and (b) social unrest over the environment. **Sustainable development and ES are mutually reinforcing.** Ostensible superiority of humans over nature since the onset of industrial revolution with technological change breakthroughs was fueled by economic thinking oriented at economic growth as well as growing consumption and production as targets for achieving well-being. It was developed at the expense of the environment that was considered to be limitless, having

infinite assimilating capability in spite of all its disturbances. Of accounting point of view, natural (environmental) resources were taken as free. Their loss, e.g. cutting down trees, contributes to the GNP growth as production output until the last tree is cut. After that GNP sharply falls (WRI, Dec.1991).

The scientific revolution of the 1950s greatly contributed to the environmental deterioration. Instead of independence from the environment technological change, economic development and adopted value systems increased human insecurity and threats from environmental changes. In fact, technological change was the foundation of military-industrial complex. Structural military security was behind functional economic security. In fact in totalitarian regimes economic, humanitarian, and political insecurity was compensated by overinflated military security. The growth of GNP was a reflection of such thinking.

Developed nations handle rather easily the **three components** within their countries or regions to achieve their own environmental sufficiency. However, their efforts are often made using the Not-in-my-backyard approach increasing the environmental North-South disparity (and tensions) - the so-called 'environmental footprints', with externalities shouldered by the latter and following generations, unless some kind of international ES management is exercised. The direct causes of environmental change and the scarcity are linked with the established pattern of technological change. The latter is influenced by established economic mechanisms and instruments aimed at patterns of traditional neoclassical economics oriented at economic growth with modern consumption and production patterns which, in its turn, are linked with the disregard of environmental values.

## **EVOLUTION OF ENVIRONMENTAL CONCERN**

**The environment has been a human security concern** (in fact, a survival issue) for humans for millennia. Devastating natural disasters claiming lives, disrupting economic activity, ruining human artifacts, affecting life styles are still often handled at top national and, sometimes, international levels. However, technological change (the build-up of the technosphere) made an illusion of human independence or their protection from nature adverse impacts.

In the late 19th century, burgeoning natural resource intensive industrial activity led to the creation of small public (mainly, scientific) groups urging the protection of animals and plants from overexploitation. The scientific environmental movement culminated in setting up the International Union for Conservation of Nature and Natural Resources (IUCN) in Switzerland in 1948 that co-authored the World Conservation Strategy in 1978. The International Geosphere-Biosphere Programme was launched in the late 1980s and later complemented with the Human Dimensions of Global Environmental Change Programme. Thus, the environment became a scientific community priority issue.

The scientific revolution in the 1950s resulted in the growing understanding, only twenty years later of severe negative human-made quantitative and qualitative changes in the human environment. In addition to social limitations imposed on technological development,

environmental limits were recognized. Scientists, and the public at large, joined efforts to make governments heed environmental problems and change the course of development.

The 1972 UN Stockholm conference set up UNEP and gave rise to environment institution building at government levels. However, they became essentially environmental conservation and clean-up sectional agencies loosely connected with other ministries. Particular attention was drawn to environmental, end-of-the-pipe controls that sometimes added another sector of the economy instead of permeating it. However, the UNCED vividly demonstrated the importance of the environment-economy nexus and the need to bring the business community in it. The environment figures prominently on the North-South agenda nowadays. Thus, the environment has become a government priority both nationally and in international fora.

In the meantime, the environment, in particular its purposeful modification played a role to gain military superiority. The environment was both a target and a weapon in military action which gave rise to a body of international legislation in order to stop this use of the environment (Wetting A., 1984; 1986). Its lacunas are vivid from the recent examples of using oil for marine and air pollution in the Gulf war and blowing up a dam protecting a pond with hazardous chemicals during the Moldavia ethnic military conflict to pollute a nearby river that was a fresh water supply source. The use of the environment as a weapon in conflict may develop in view of future natural resource scarcities (Glee, P., 1992)

The intentional adverse use of the environment as a weapon in settling disputes should not be discarded as manifested in the Gulf war. The notions of ‘the environmental terrorism’, environmental crimes are now discussed. Military related environmental adverse human impacts during numerous local wars fuel international tension.

In the mid-80s it was noted by UNEP’s executive director that the thread of national security, and hence the thread of global security, was interwoven with the environmental issues at hand. (Tolba, M., May 1984). He also stated that the traditional military concept of security was becoming increasingly obsolete. (Tolba, M., Oct.1984).

In the meantime environmental stress (due to a growing scarcity of environmental resources and a dwindling quality of those available) became a recognized source and effect of political Tension and military conflict, i.e. a security issues. (Our Common Future, WCED, 1987). It was pointed out that the future well-being of the human race, its security on this planet, depends on minimizing and managing negative environmental effects of human activities, whether they result from industrial pollution or the pollution of poverty. **The relationship between environmental issues and their management and national and international security were taken as a given. (UNEP, 1989).**

Hence, the **environment became a security concern.** However, it is not treated so institutionally neither at national or international levels yet. Various proposals were made to set up a UN environmental security (ES) council or an ES committee at the UN Security Council before the UNCED (Evteev et als, 1989; Gebremedhin et als.1989) but the latter did not even discuss environmental security matters. In fact, it was noted that early on in 1989 the Western group made it clear that military activities would not be a subject for negotiation under UNCED

(The Earth Summit, 1992). That may have entailed that the whole area of environmental security was left out to be dealt with in the post-UNCED period. After the conference M.Strong, UNCED secretary-general, stressed **the necessity of 'investment in environmental security'** (Strong, M., 1992).

The book "The world environment 1972-1992. Two decades of challenge". Ed. by M.Tolba, O.El-Kholy, E.El-Hinnawi, M.Holdgate, D.McMichael and R.Munn. UNEP. Chapman & Hall.London stresses that **the concept of security has evolved into a view that embraces the interlocking elements of environmental security, individual security, societal security, economic security, and military security.** It is now abundantly clear that the insecurities that first occur in or around those parts of the world facing serious environmental problems, particularly in the least developed countries, spread out quickly to threaten whole regions. There are also signs that conflicts over shared water resources could increase in several parts of the world. (UNEP. Nov.1992). Environmental security is viewed as an inseparable component of comprehensive international security, the upholding of which is a shared responsibility of the entire international community. (N.Gebremedhin et als.,1989).

Various agencies of the **US government** use the concept of environmental security including: the Central Intelligence Agency, Defense Intelligence, Department of Defense, Department of State, and the Environment Protection Agency. There is no official definition that unifies thinking and action related to environmental security; rather, each group has developed its own understanding. Thus the CIA and Defense tend to stress the relationship between environmental change and conflict and instability. (R.Matthew. School of Foreign Service, Gergetown University, his letter of Feb. 11, 1998)

US President Clinton and Secretary of Defense Aspin have created a new position - that of the deputy under-secretary of defense for environmental security - in the Department of Defense to highlight the importance of the environment in national security. The Clinton Administration is unified in recognizing that environment is important to US national security, and can be a factor in conflicts throughout the world. In his Earth Day statement in April 1997, secretary of defense Cohen said, "environmental protection is critical to the Defense Department mission and environmental considerations shall be integrated into all defense activities'. (Remarks for Sherri Goodman at the Woodrow Wilson Center Meeting, May 9, 1997)

## **RE-DEFINING SECURITY**

The Palme Commission advocated 'common security' (Independent Commission on Disarmament and Security Issues.1982) focussing on the mutual vulnerability of contemporary societies that challenges the usefulness of unilateral national military security and calls for mutual co-operation and disarmament. However, it failed to consider the environmental dimension.

**There are numerous definitions of security.** S.Lodgaard stresses that traditionally, the goal of national security policies has been twofold: (1) to preserve territorial integrity; and (2) to preserve the right to self-determination. In his view the concept of environmental security is



fairly precise and politically useful, albeit still rather controversial. (Lodgaard, S., 1992).

It is also argued that security is about providing protection from threats to social order (Dalby, S., 1992). In fact, at the national level security is provided by the state to its people. It has never been limited to military security covering traditional social (including human rights), medical (Medicare), and economic (protecting entrepreneurial and other economic activity). Military forces have been just one of the security maintaining instruments. Thus, objects of security activity are traditionally the country's integrity and its protection in the international community. The country's integrity includes the security of its people with their health and wellbeing, territory, economic activity, social (and political) institutions, social order, and lately sound environment (integrity of ecosystems and natural cycles). The international dimension of national security includes the creation or maintenance of international climate conducive to the country's sustainable development whatever it means depending on a selected strategy.

The impossibility of performing these tasks alone leads countries to create military, political, economic alliances on some common basis (territorial, ideological, cultural, humanitarian grounds). In international agreements, conventions or organizations, states always give away some part of their sovereignty and decision-making capacity to an international entity (a treaty, convention, agreement, organization). Moreover, trans-boundary transfer of pollutants, regional, and global environmental issues are permeating national boundaries and can conventionally be treated as the infringement of national sovereignty or an aggression. Obviously, that represents an environmental threat to the population health, erodes buildings, monuments, and paintings as in the case of acid deposition and, thus, affects environmental security. However, this 'aggression' is usually unpremeditated and it is hard to identify 'the enemy'. Even if the polluting country is identified, the military solution is often inapplicable.

It has been known for centuries that natural resources, along with territorial claims (another natural resource) and people as additional labor force, are often the main goals in international conflicts with the use of violence and military weaponry. Such violent, often unlawful, action of one country against another is usually called 'aggression'. The confronting parties in a conflict are called 'enemies' or 'adversaries'. The protection of the nation-state (with its population, social institutions, economic wealth, etc.) As well as its sovereignty from an aggression or a threat thereof is, in fact, 'security'. Therefore, the **military security is such protection based on military means (weapons and associated technology)**. The notions of 'vulnerability', 'threat', 'deterrence', 'military sufficiency', 'parity' are in general use.

The distinction between **threats and vulnerabilities** points to a key division in security policy, namely, those states can seek to reduce their insecurity either by reducing their vulnerability or by preventing or lessening threats. In other words national security policy can either focus inward, seeking to reduce the vulnerabilities of the state itself, or outward, seeking to reduce external threat by addressing its sources. (Buzan, B., 1992)

**Environmental threats (adverse changes)** often result from international environmental problems: the waters around Denmark are fouled up, not only by that country, but by those of all other North and Baltic sea countries; the Chernobyl accident is another example of an international environmental threat (Peterson, N., 1988) In future 'unconventional threats' may

pose a greater problem for Canada and the international community than the standard or conventional threats. It is stressed that a new definition of security must include, in particular, an appreciation of the importance of resources and the environment as key components of security. (Loneragan, S., 1992). Environmental changes may become a cause of acute conflict. (Homer-Dixon, T., 1991).

Heavy guns were used during the 'Cod War' in the North Sea as recently as in the mid-70s. This was an example of a military conflict around an extraterritorial natural (environmental) resource' or, to be exact, an environmental resource in extraterritorial waters.

**The two major converging trends occurred recently.** First, the notion of security has acquired specific object (or external undesirable change) orientation such as food security, humanitarian (human rights protection) security, economic security, and environmental (or ecological) security.

On the other hand, natural resources (or assets) are now considered to be part of the broader notion of the environment while the notion of resources is being stretched. In fact, environmental amenity such as a nicely looking landscape is seen as a non-exhaustible environmental resource. In addition, changes in the environment with adverse direct or indirect impact on human health and welfare are given much attention.

The resulting uneven **worsening of environmental situation** (because of the uneven local impact of global, regional, and international environmental problems) for nation-states and people or of their access to environmental resources has lately been contributing to intra- and international tension. Furthermore, the **property rights to unconventional environmental resources** (the atmosphere, outer space, international water bodies, etc.) are often unclear or not properly specified, which exacerbates tension. In addition to the above-unpremeditated adverse environmental impact countries can intentionally resort to using the environment as a weapon (environmental warfare) or individuals (ecoterrorism) can undertake that.

The developing nations stress the necessity of an updated, more comprehensive definition of 'collective security' that should include tackling, in particular, environmental problems and thus the underlying national and international causes of conflict that may otherwise later require emergency peace-keeping measures. (The South Center, Oct.1992). They point out that potentially conflicting issues are multiplying in the South and the North, including, in particular, the environment. The future development of the countries of the South, now increasingly described in terms of 'sustainable development', depend significantly on 'environmental space' to accommodate their industrialization and rising living standards, that must essentially be made available through corrective actions on the part of the developed countries to reduce current and future pressures on the environment. (The South Center, Aug.1992).

**Security is increasingly related to the pursuit of freedom from threat and in the international context** (Buzan, B., 1992, p.13). It is about the ability of states and societies to maintain their independent identity and their functional integrity with the bottom line being about survival and existence. However, above this line things may even be more blurred and be easily mixed up with everyday uncertainties of life. B.Buzan treats the personal security of

individuals as secondary making the sovereign territorial state the standard unit of security. Most states are bureaucratically much better equipped to be sensitive to military, political and societal threats than they are to environmental ones. Regional, trans-boundary, and global environmental changes and threats thereof are beyond the capacity of individual states and call for collective international efforts. Furthermore, the notion of sovereignty becomes fuzzy because of trans-boundary and global environmental problems.

Breaking down the security of human collectivities into five **major interdependent sectors** - military, political, economic, societal, and environmental - B.Buzan defines the latter as the maintenance of the local and the planetary biosphere as the essential support system on which all other human enterprises depend.

B.Buzan discusses the notion of national security and its environmental dimension. He argues that an uncontested universal and all-purpose definition of security may be impossible since security is akin to such notions as love, justice, equality, power, and liberty. But while it is a tricky idea to apply, it also has enormous power as an instrument of social and political mobilization. Security is a positive value. It can be seen as a right. To classify something as a security issue is to legitimize exceptional measures of collective action. He points out that those who wish to raise the political profile of environment need to consider carefully whether their purposes are best served by casting environmental issues in security terms, or whether it would be wiser to address them as part of the economic agenda. (B.Buzan)

## **NEW DIMENSIONS OF SECURITY**

Traditional security thinking centers on the nation-state and is linked with 'actor' (or enemy-state) related military or non-military (e.g., trade barriers, embargoes) threats. Structural threats like resource depletion and degradation, AIDS, drugs or environmental threats are also often considered in terms of looking for and dealing with an enemy.

The natural environment has become a medium of unintentional environmental aggression or intrusion through the trans-boundary transfer of air and water pollutants (another kind of 'ads'). The global environmental change is causing a general international concern and its effects can unevenly struck individual nations.

**Ecology suggests a different understanding of security. Strength is not measured in terms of physical metaphors but in terms of diversity and redundancy. Survival relates to sustainability, which depends on cycling, and conservation of resources.** Environmental security challenges the claims of state sovereignty, precise boundaries, and military force. It also challenges the modern presuppositions of security and sovereignty as control.

Environmental security offers a more fruitful basis for cooperation among nations than military security because it is both a positive and inclusive concept requiring and nurturing more stable and cooperative relationships among nations (Renner, M., 1989).

Many environment related conflicts over the years follow this pattern of thinking, especially between countries sharing terrestrial and marine ecosystems (e.g., regional seas, international

rivers, extraterritorial fisheries, trans-boundary air pollution), have shown that the environment is also a national security problem, though of subregional or regional scale. Environmental pressures and competition for resources, especially within the global 'commons' are expected to give rise to additional conflicts among nations. (Piraguas, D.C., 1992). Environmental threats to peace and security are growing at a frightening pace. The global environmental changes may become the major non-military threat to international security and the future of the global economy (MacNeil, J. Winter 1989-90).

**Environmental security presupposes looking for sources and actors behind them (since many environmental changes are human made or induced and sources are linked with some societal institutional structures - communities, companies, nation-states) but since environmental 'threats' are usually non-premeditated, actors with whom environmental threats should be discussed should not be treated as enemies.** However, the first reaction was to impose sanctions, develop a conflict or even resort to fighting (e.g., the 'cod' war in the North Sea). Recently, attempts to look for environmental parity solutions have recently started. They are discussed later in this paper.

**Diplomatic conferences on environmental issues** (e.g. combating the ozone layer depletion), the development of environmental domestic and international law, the adoption of a package of resolutions on environmental matters at every UN General Assembly session, the placement of the environment on the agenda of G-7, G-77 countries, the North-South dialogue, NATO, EC, and other global significance international fora stressed the political dimension of environmental problems since they affected integrity of the national and international relations fabric.

In 1985, the Warsaw Treaty Organization adopted a statement on the consequences of arms race for the environment and other aspects of environmental security ('Soviet Russia', 1988). **A draft resolution on international environmental security was discussed at the 42nd UN GA** (UN, 1987; UN, 1988) but failed to be adopted because **the difference between environmental security and environmental protection was not clearly indicated and, in addition, it was also not clear how to make this concept operational.** However, western diplomats, being not certain about the validity of the subject per se, were suspicious towards it if only because it was introduced by Soviet block countries. The Soviet foreign policy in the late 1980s, specially in the UN, contained an apparent environmental component in an attempt to invigorate ineffective internal environmental activities. (Perelet, R., 1988; Shevardnadze, E., 1989)

**UN GA Resolution 42/442 on environmental security** referred the matter to the 43rd UN GA session at which **the ES notion was dropped.** Despite these developments the concept of ES is still being actively debated among scientists and international fora. In late 1991, NATO adopted a new strategic concept that recognized an environmental component of security. (NATO, 1991).

The 1992 UN Conference on the Environment and Development (UNCED) has firmly linked the environment with development, adding economic factors to ecological and legal ones. Placing environmental issues only on the economic agenda would narrow their scope and significance. However, the UNCED failed to address military and other delicate security dimensions of the environment.

However, the access to useful natural resources and the expansion of territories were always national security issues in the economic domain. In fact, wars for natural resources and territories were considered to be an extension of the national economic policy by military means.

Concern over 'environmental security' has grown dramatically as scientific evidence mounts on the consequences of acid precipitation, the depletion of the stratospheric ozone layer, and global warming. (Soroos, M., 1990).

### **ENVIRONMENTAL SECURITY FOR SUSTAINABLE DEVELOPMENT**

According to J. Galtung security is based on the goals of the environment and development systems (Galtung, J. 1982). S. Lodgaard underlines that environmental conflicts are becoming more urgent. These fall into two categories: human beings against nature - a question of sustainability; and human beings against other humans - a question of development. The key to conflict resolution is sustainable development (Lodgaard, S., 1992).

The concept of sustainable development indicated in the World Conservation Strategy in the late 70s and made the cornerstone of the Brundtland Commission report has received general international support at the UNCED. The attention is now turned to changing patterns of life style (production and consumption patterns) and the population growth issue as well as the management of international environmental externalities, international and global commons, the distribution of environmental costs (liabilities) and benefits among nations. The elaboration of international and national environmentally sound 'rules of the game' in economic activities to make use of dynamic market forces and entrepreneurship for correcting 'market failures' and improving the state of the environment.

A change from economic and socio-economic development (with economic growth indicators and monetary economy), from the environmental protection to socio-environmental sustainable development (aiming at social and environmental objectives) with an effective (economic) mechanism of allocating resources to meet human wants and preferences.

**Environmental security issues also challenge the political organization of 'development', and the perpetuation of modern (state) models of social organization, and the global political order to establish innovative new modes of governance.** In many ways they point to the inadequacy of market and state run economic arrangements to meet the basic needs of populations. Environmental themes have also facilitated the construction of new political networks linking grassroots groups into an expanding global civil society. Environmental movements are also operating in ways that violate the theme of the state as a political container. (Dalby, S. 1992, p.515).

In environmental issues often the most important political factors are local citizens groups, social movements, international environmental organizations, transnational corporations or the social arrangements of land tenure. In linking environment to solely state defined

understandings of security there is a danger of only addressing government agencies and advocating their survival. (Dalby,S, 1992, p.517). In fact, in the mid-80s three quarters of the world's development was financed by the private sector (UNEP, May 1985) that was the major source of environmental stress.

Security cannot be provided by continuously denuding ecological resources and assuming that the miracles of the market and military technology will always provide the answer (Dalby,S, 1992, p.518).

It has become habitual that international environmental issues need to be considered in a systemic way and not limited to a clean-up issue. **Environmental values are being considered on their own merit along with material and social values. Rights of individuals to healthy environment are declared to be possibly complemented by rights of individuals, communities, and countries to environmental security.** However, conceptually the notion of environmental security has not been broadly accepted, though it has been discussed in the scientific community for more than a decade.

Institutionally, environmental security issues are often handled by governments and international community on an ad hoc and piecemeal basis. There are strong warnings that humankind is beyond limits. One of the characteristics of that situation is increasing conflict over resources or pollution emission rights, less social solidarity, more hoarding, and greater gaps between haves and have-nots (Meadows,D. 1992).

Natural disasters severely affecting poorer (more vulnerable) countries require huge resources to mend their consequences and often lead to the displacement of people to other countries causing or exacerbating international tension and calling for humanitarian assistance.

Human-induced natural disasters and environmental changes affecting unevenly many or all countries raise the question of settling international disputes about the size of contribution of individual countries to these changes and of impact (damage) incurred by others as well as of liabilities of the former and the distribution of liabilities among the latter.

The rising density and the scale of human activity that are significantly associated with the market as the main driving force of expanding human activity and the growing population lie behind major environmental changes and cause environmentally related international tension and conflicts (polluting externalities and the 'not-in-my-backyard' approach). Like economic cycles, many environmental changes represent threats without agents that complicate the security issue. The security label is a useful way both signaling danger and setting priority as well as characterizing environmental issues for political purposes. It is especially urgent now that the military security agenda has scaled down from global to local conflict resolution while environmental and economic one gets more dynamic and more central to day-to-day concerns.

Human conflicts with (or pressure on) the environment necessarily lead to environmentally related conflicts among humans. **To different economies, environmental security may have a different national or regional emphasis.**

Advanced industrialized nations may be concerned to continue **access to resources** of the global commons for their own exploitation; with harmful effects of pollution (in water bodies and the atmosphere) that affect the quality of their own national resources; and with industrial, technological, and other hazards of toxic or radioactive releases.

H.Daly and J.Cobb discuss the three greatest threats to the security of the United States: environmental, the decline of national morale and economic decline. The environmental threat is the erosion of the soil, the pollution of the air and water, the extinction of species, the poisoning of the land by chemicals and nuclear war, and the combined threat of ozone depletion and the greenhouse effect (Daly,H., Cobb Jr.,J. 1990).

On the other hand, developing nations may be more concerned with the immediate satisfaction of their basic needs, including needs for food, fuel, or water, and get compensation for environmental externalities they have to bear. T.Homer-Dixon singles out four principles, often interlinked, social effects of environmental changes: decreased agricultural production, economic decline, population displacement, and disruption of legitimized and authoritative institutions and social relations (Homer-Dixon,T., 1992). Environment related human health impairment could be easily added to this list.

**Environmental security should be equitable for states, cultures, and generations.** Problems of environmental security cannot be solved within national frontiers which usually do not correspond with ecosystem boundaries. **The notion of sovereignty is difficult (if not impossible) to maintain within an ecological frame of reference. The very essence of ecology is based on the concept of interdependence rather than independence.** As a first approximation, it could be argued that environmental security problems must be responded to at the ecosystem level at which they occur, whether inter-state or encompassing international commons (Gebremedhin,N. et als.,1989).

Economics for community aims at the sufficiency of goods for the sake of community well-being, and not at the endless growth of production and consumption. The sufficiency sought must take account of the community's need for security, but this way of thinking is disinclined to identify security with quantity of arms and their technological sophistication. On the other side, an economics of community is committed to serving the national well-being. It sees that well-being in comprehensive ways, and security is a prominent part thereof.(Daly,H.,Cobb Jr.,J., 1990, p.333).

Nowadays diminishing traditional resource quantity (physical scarcity) is now supplemented by new resources and, what is really new, by waning resource quality which leads to the search for both additional and better quality resources internationally.

Therefore, in addition to the scarcity of traditional natural resources (such as fossil minerals) attention has lately and increasingly been drawn to **the expanded notion of resources**, namely, to the environmental resources the scarcity (in terms of depletion and loss of biodiversity) of which may be considered as a factor in international tension. These additional considerations reflect the appearance of **new scarcities** such as those of drinking water, topsoil, conditionally renewable natural resources (e.g. forests, biodiversity), natural amenities.

The natural environment is viewed not only as a shrinking source of goods but also a limited sink for bads (waste).

The present generation may foreclose a number of options for the future generations which could result in inter-generational tension. However, it is hard to tell in which way it can be manifested (e.g., the neglect of elderly population?) in the 21st century.

Furthermore, **international trade has become a human-made trans-boundary carrier of environmentally unsound technologies, industries, goods, and wastes ('bads'). In this case the notion of the enemy gets blurred.** However, the vulnerability of states has added an environmental dimension. The environmental defense or, rather, security becomes important at national, international, and global levels.

Natural and environmental catastrophes are turning into famines, which produce a growing stream of refugees fleeing from poverty and environmental disasters. The UNEP estimates that by the turn of the millennium one billion environmental refugees will have been displaced from their homelands because their basic means of survival have been destroyed (Nuscheler, F. 1991).

In general, perfect security is hardly obtainable or definable. That is why attention is usually drawn to dealing with insecurity, or with threats to and vulnerabilities of specific societal entities in the security framework. Of all threats, those are singled out that affect integrity, identity, and independence of the security subject. Sometimes this is a matter of political choice rather than an objective fact taking into account specific or diffuse, temporal and spatial nature of threats, their probability and consequences, uniqueness and previous historical experience, etc. B. Buzan argues that perhaps only the Dutch have a well-developed historical sense of environmental threats as a national issue (B. Buzan).

Threats accepted on the political agenda are usually legitimized and the mobilization of resources and the use of extreme measures, sometimes including force, for their management are effected. Thus **the goal of security is to protect from (remove or alleviate) external and internal threats and keep vulnerability low.**

The management of threats (or environmental changes) involves their monitoring, identification, analysis, assessment (including perception), threat communication, and management of threat realization (emergencies). The management of vulnerability is the development of the capacity to withstand or be insensitive to threats. Many of these threats are increasingly of international (regional to global) nature.

## **GLOBAL CHANGE AND ENVIRONMENTAL SECURITY**

The issues affecting sustainable development options are especially manifest in the case of global environmental change (GEC). The environment rarely comes as the sole or even main cause of social (intra- or international) tension. **The five main factors affect international security in the case of GEC and cause or contribute to social tension:**

a GEC heterogeneous perception by countries,



its uneven impact on countries and regions,  
a differing contribution of countries to GEC,  
a heterogeneous national/regional response and the capacity to respond to GEC,  
risks and uncertainties in the knowledge about GEC

In addition, environmental issues are often linked with others and used as a bargaining chip in international negotiations.

International environmental dimension of GEC has recently received growing attention (Keyfitz,N.,1991; Doos, Bo.R.,1991; Maier-Regaud, G.,1991).

Global environmental change is increasingly considered to have resulted from (e.g. the ozone layer depletion) or been exacerbated (climate change, the loss of biodiversity) by human activities, with an appreciable time lag between human action and nature's response.

On the other hand, there is a body of literature that discusses approaches to environmental security (Perelet,R., Nov.1991, Perelet,R. 1991; Perelet R. et als., 1989;.Gebremedhin et als.,1989; Galtung,J.,1982) and attempts to make institutional proposals for the UN system without taking a systems view of the GEC-sustainable development-environmental security interrelationships.

Global change will probably raise the level of stress in the international system, increasing the likelihood of conflict and impeding the search for cooperative solutions. In addition, it may force to revise our network of concepts such as 'state', 'sovereignty', 'national interest' and 'balance of power'.(Homer-Dixon,T. winter1990, p.3). For example, climate warming in the Arctic may result in ice-free access to its seabed/off-shore mineral resources, the use of northern sea-routes, a change in human settlement/economic activity (including fishery, waste disposal) areas, telecommunication paths.

There is a need to think systematically about conflicts arising from the expectation that future global change could benefit some social groups, countries, or generations at the expense of others; from direct consequences of global environmental change, such as migrations of environmental refugees or pressures to redraw borders in the face of changes in agricultural productivity; and from long-range and direct consequences, such as disruption of ecosystems due to acid precipitation or loss of global biological diversity resulting from activities occurring within domestic jurisdictions of single countries. Some of these types of conflict will prove resistant to resolution through ordinary procedures for handling social conflict, such as diplomacy and negotiation. (P.Stern, Young,O., Druckman,D. (ed.), 1992).

**The following environmental security risks should be taken into account:** changes in 'free' environmental services (availability and distribution among countries is a critical issue), such as changes in seasonal weather patterns, sea level rise, biodiversity patterns, ecosystems (both marine and terrestrial) biomass. These changes affect the economy (agriculture - crop yields and structure, irrigation patterns, pests, etc.; fisheries - food security; fresh drinking water supply; industrial siting; energy requirements and supply, and development investment pattern) as well as the social fabric (environmental refugees, change in life styles and access to

natural resources, etc.). These changes may lead to global change related intra- and international tensions and conflicts.

The relationships between climate change and acute conflict can be traced back in history with reference made, in particular, to climate induced floods and subsequent food shortages that triggered popular unrest in Castille in the fifteenth century.(Homer-Dixon.T., Fall 1991).

At present, in connection with global warming Canada is concerned over growing demands in the northern hemisphere for the biotic and abiotic resources since international competition for these resources - and the methods and rate at which they are harvested - have become major sources of conflict and negotiation. Controversies have arisen over fishing equipment, marine pollution, resource ownership, and territorial and jurisdictional disputes. Population displacement is taken seriously in this context since conflicts between indigenous peoples and forced migrants could represent a major security concern in the future. (Environmental Security Panel Decides on Two Case Studies. Delta, 3,1, summer 1992, pp.6-7).

Global policy problems involve relationships between states, the need to manage domains that are beyond the political jurisdiction of states. Some ostensibly internal problems become global policy problems when the outside community takes a special interest in them (e.g. Amazonian rain forest, lake Baikal).

There are many examples of environment-security linkages that suggest possibilities of environmental, in particular, climate change, food issues, water conflicts, access to Arctic minerals in a 'greenhouse world', environmental changes in the Phillipines, Mexico and the middle east, ozone depletion to trigger instabilities and and security concern. (Dalby,S, 1992, p.510).

In the meantime international economic, political, humanitarian, and even military debates are being increasingly loaded with environmental issues that affect integrity, identity, and independence of countries as well as the health and well-being of their populations, i.e. their security.

For example, biodiversity issues include the distribution of costs and benefits in using freely available germplasm in the South for the needs of medicine, agriculture, and biotechnologies in the North to be later sold as trademark protected products to the developing countries (the issue of the infringement of sovereignty by freely privatizing biodiversity as global commons within national boundaries). Global climate change management includes the distribution of CO2 related liabilities of developed countries accumulated over decades among all countries in the atmospheric global commons and setting up henceforth quotas and charges for exceeding the latter. These issues generate heated international debates.

The two major sources of international conflict: first, a human-nature conflict that results in environmental asset insufficiency (scarcity) at national, regional, global levels, and second, acute differences (disparity) in environmental wealth among countries. **Environmental insufficiency and disparity are manifestations of new environmental scarcities.**

The direct impact of these scarcities on population impairs its health and welfare and leads to human disquiet and/or displacement elsewhere. The indirect impact - perception of these scarcities (as some other countries' externalities) makes countries (their governments) to seek abroad a culprit or an enemy to put a blame on. Internalizing or trading in ecoexternalities becomes important to settle environmentally related disputes. The recent studies indicate that scarcities of renewable resources can contribute to conflict, and the frequency of such unrest will probably grow in the future.

However, what is important is whether people are harmed by scarcities and whether political and economic systems could provide the incentives that enable people to alleviate the harmful effects of environmental problems. In any case, the entire Middle East is argued to face increasingly grave and tangled problems of water scarcity that can affect the region's stability. Tens of millions of Chinese are estimated to try to leave the country's impoverished interior and northern regions - where water and fuelwood are desperately scarce and the land often badly damaged - for booming coastal cities which can lead to bitter disputes among these regions over water sharing and migration. (Homer-Dixon, T. et als., Feb.1993).

The following strategies for regional international community can be suggested:  
the "think globally, act locally" approach;

participation in global preventive strategy elaboration (global commons management with carbon taxes, tradeable permits, global green fund, a global climate change (GCC) monitoring system, etc.;

regional co-operation on:

- (a) setting up buffer stocks (an insurance policy); adaptation policy - creating water, food, energy, gene banks, e.g. making water reservoirs for regional use and access, management of international ground water aquifers; arranging access to environmental resources outside the region;
- (b) management of GCC vulnerable ecosystems (e.g. desertification, tundra changes in the Arctic);
- (c) regional monitoring of GCC and human response (perception, communication, analysis, assessment);
- (d) regional management of GCC-related natural calamities;
- (e) regional management of sea level rise (defensive construction, salinity intrusion in estuaries);
- (f) management of GCC-related international tension and/or conflicts (negotiation mechanisms, environmental diplomacy, conventions, technology transfers, etc.).

Efforts in the above directions at the international level, especially, through the Human Dimensions of Global Environmental Change Programme can be very instrumental (Jacobson, H. et als., 1990).

## MANAGING ENVIRONMENTAL DISPARITY

**National environmental security (and sovereignty) can be affected by three major factors (two external ones and an internal one):**

- trans-boundary, regional, global environmental change adverse impact on the nation-state' environmental space,
- the use of international trade for overexploitation of the country's environmental resources and for transfer of environmentally unsound technologies, industries, waste (the 'not in my backyard' - NIMBY - approach effect);
- a country becomes a source of goods and a sink for bads internationally,
- environmentally unsound internal development.

International responsibility and liability of states, enterprises, companies for overexploiting and fouling the environmental space (or ecosystems) grows in importance to settle international disputes and conflicts. Adverse environmental effects or threats on states can be accidental or cumulative; of natural, human-induced natural, or purely anthropogenic (e.g. CFC releases) origin.

Differing national environmental 'potentials' cause international tension. **Hence, a need for narrowing these potentials to achieve ecoparity** (Perelet, R., Iakimetz, V., 1992).

Environmental parity oriented instruments (environmental resource transfer or access instruments) at state and company levels have recently been given greater attention and include the following:

- off-set investments that allow firms to remedy environmental damage in one country by cheaper countervailing measures in another,
- tradeable pollution permits that fix global emission limits for countries or industrial sections,
- reduced import tariffs on environmentally sound technologies, goods and equipment,
- tax breaks for the use of 'green' technologies,
- more flexible repatriation limits for income made from these technologies which could provide firms with necessary financial break to enable investments in more costly, green technologies in less developed countries,
- higher tariffs or taxes on polluting products or technologies, with the revenues collected to be used to subsidize the acquisition of environmentally safe technologies,
- bulk purchase agreements for a region,
- purchase guarantees by bilateral, multilateral or regional funding agencies which could underwrite less developed country purchases of sound technology,
- an international technology bank, funded by country pledges, could acquire the rights to innovative green technologies so as to make them easily available to environmentally less advantageous countries,
- an international center to settle investment disputes could curb restrictive business practices that block environmentally less advantageous country access to sound technologies, such as restrictive licensing arrangements and prohibitively high prices,
- debt-for-nature swaps,
- development assistance programmes that could also provide additional impetus to

green technology transfers. Some of these instruments have already been used (Transnationals, 1992). Their efficiency varies.

### **ARGUMENTS AGAINST THE NOTION OF ENVIRONMENTAL SECURITY**

However, it is sometimes argued that linking environmental themes to national security is a mistake which leads away from dealing adequately the environmental challenges already facing the planet. However, in this case security is narrowly considered to be handled by military means which is often inappropriate against environmental threats. 'Defining environmental issues in terms of security risks is in itself a risky operation... we may end up contributing more to the militarization of environmental politics than to the demilitarization of security politics' (Brock, L.1992).

L.Brock warns that the concept of environmental or ecological security invites some second thoughts, not necessarily to be discarded but perhaps to be used with some caution. He argues that security policies are essentially status quo oriented. "The most common argument against change is that it might jeopardize security. With this connotation of security, the term 'environmental security' would become a contradiction in itself, because ecological thinking is static and specific. The contradiction can be overcome by re-defining security to make it conducive to ecological thinking. However, in the light of the previous experience with 'economic security' he believes that the concept of environmental security - regardless of intent - may be invoked to defend the status quo of the present world ecological order, in which the distribution of benefits from environmental degradation is clearly in favor of the highly industrialized countries".

Furthermore, defining ecological interests in terms of security needs could contribute more to the militarization of eco-politics than to a demilitarization of traditional security thinking at a time when military budgets will be shrinking substantially due to changing international threat perceptions after the demise of the East/West conflict. It may be tempting for the military to embrace environmental concerns as a fashionable field of activity. Or if the military is tempted to take over environmental tasks, then researchers should formulate some counter-claims. Whether this can be done by first referring to environmental problems as security issues and by then trying to give the security issues a meaning conducive to the values of peace research remains an open question. (Brock, L. Nov.1991). In addition, L.Brock believes that singling out 'environmental security' may place it over economic and social aspects of security.

L.Brock suggests that the environment should be delinked from national security. The issue to be considered would be social security or food security rather than national security. But here, too, he points to various problems to be solved.

(1) If it were assumed that the environment is part of security needs, then the longing for security may be one of the major obstacles to the kind of change that would be necessary to attain environmental sustainability.

(2) Indicators for environmental security are difficult to establish. In the case of food security, a certain intake of calories has been defined as demarcating line between security and

insecurity. But, with the environment, there is no 'safe' pollution.[this is a weak point. First, there no exact numerical indicators of when a conflict or a war may start but military security is well recognized. Second, there are norms - maximum allowable concentrations for many pollutants, etc.)

(3) He raises an interesting point - conflicts among different kinds of security . He thinks that social and food security cannot contradict, while ES can with them. Then, environmental security may be viewed differently for different people. The poor may degrade the environment (to lower environmental security ) in order to raise their food security. [But different kinds of security can be related to different kinds of needs that also compete.]

He says that development cooperation cannot be defined away by referring to environmental security is a basic human need (p.32). He stresses that social relations cannot be viewed as security needs. Security and human right lose their specificity if they are applied to every conceivable private grievance and public concern. Establishing a hierarchy of security concepts, in his view, is no way out by constructing environmental security as some form of super-security encompassing good governance, participatory democracy, economic security, and so on. In his view, one should not fall into a trap of claiming a new way of looking at the world while doing no more than giving new political challenges new names. (p.32).

(Brock, Lothar. The environment and security: conceptual and theoretical issues. In book "Conflict and the Environment." Ed. by N.P.Gleditsch in collaboration with L.Brock, T.Homer-Dixon, R.Perelet, E. Vlachos. Kluwer Academic Publishers. ISBN 0-7923-4768-4. 1997).

R.Moss questions the usefulness of using the notion of environmental security. He considers its two meanings as he sees it. First, the notion could be used to call attention to the fact that 'the security of the environment' needs to be protected from the threats posed to it by human activities. Second, it could be intended to imply that threats posed by global change or environmental degradation could have something in common with the sorts of threats of organized violence that are normally considered to threaten national security (Moss,R. 1992).

In fact, he gives preference to the first meaning. However, in this interpretation, the achievement of environmental security is linked with environmentally safe human (or technological) activity or as he rightly puts it it is equated with 'sustainable development' which is different from the extension of the notion of security adding its environmental dimension. He argues that because 'security' threats typically emanate from outside a state's own borders, conceiving of environmental problems as threats to security is likely to direct attention away from one's own contributions to environmental problems. Most importantly, in his view, that the instinct for centralized state responses to security threats is highly inappropriate for responding effectively to global environmental problems. Reliance on market-based approaches to environmental problems will produce the most efficient and workable solutions. (Moss, R. 1992).

M.Soroos warns that the concept of environmental security is associated with a tendency for security concerns to lead to exclusivity as opposed to universality as well as to all consuming commitment leading to the sacrifice of other values, and, lastly, it has an inherent bias towards defensiveness and protection of the status quo. (Soroos,M. 1992).

The lack of different words in Russian for 'safety' and 'security' caused another complication (e.g. the distinction is impossible to make in Russian between 'environmental safety of an industrial factory' aimed at making 'an environmentally safe factory' and 'environmental security of a region' aimed at making the region less vulnerable, or sensitive, to adverse effects of environmental changes).

The allegedly status quo orientation of the ES notion can be waved because, contributing to sustainable development, it is part of intergenerational, e.i. future oriented security. The use of military security capabilities to handle ecoviolence, ecoterrorism, environment de-contamination may be needed. In this respect military conversion and, in particular, NATO's interest in ES and ES cooperation should be welcomed (NATO, Nov.1991). The fear about possible superiority of ES over economic security is hardly justifiable now but the need for re-allocating resources from exaggerated (both in developed and developing nations) military security budget lines to ES has been there at least for the last two to three decades. If sustainable development is the goal it should be of socio-environmental kind (i.e. aimed at meeting social and environmental objectives with efficient economic mechanisms). Two major kinds of threats (and two kinds of security to address them) would be given prominence: social (ethnic, cultural, beliefs, perception and ecorelated disputes) and environmental ones. Military superiority would give way to economic and, increasingly, environmental sufficiency development cooperation. The environmental protection in this context can be considered contributing to the achievement of environmental security, however playing a role of its own in reserving ecological diversity.

### **EVOLVING THE ENVIRONMENTAL SECURITY CONCEPT**

In order to establish the boundary conditions within which the world community must collectively work one needs to develop an analytical framework within which the linkages among the principle elements bearing on security and risk management might be better understood and evaluated (Strong, M. 1989).

Two well-documented and deeply analytical papers by T.Homer-Dixon based on findings of the project on environmental change and acute conflict at the University of Toronto (cosponsored by the American Academy of Arts and Sciences) deal with environmental change leading to natural resource scarcities and affecting environmental quality, primarily in developing countries. (Homer-Dixon, T., Fall 1991; Homer-Dixon T. et als. Feb.1993). Methodological, conceptual and practical difficulties in surfacing existing and emerging environment-social conflict relationships are amply discussed there. However, despite the range of case studies which was undertaken, the evidence for a direct causal link between environmental degradation and violent conflict remains speculative and anecdotal. (Global Environmental Change and Human Security Project. International Human Dimensions Program on Global Environmental Change. Draft Science Plan. April 1998, p.11).

**In fact, environmental changes (in natural systems and flows) of natural, human induced or human-made origin often produce adverse and usually heterogenous societal effects. If**

the rate of environmental changes exceed assimilating capacity or resilience of ecosystems and the resultant residual changes are beyond adaptive capability of human systems they are viewed by humans as environmental problems and cause concern. Thus, **ecosystem vulnerability is linked with social system vulnerability**. Since ecosystem and ecoflow 'boundaries' do not (in fact, cannot) coincide with boundaries of communities, states, and regions, the unassimilated changes in the former affect the pattern of environmental assets or access to them in the latter.

The above indicated social factors of environmental change related heterogeneity cause or contribute to social (intra/international) tension and lead to conflicts.

The human produced environmental load is a major and presently increasing source of environmental change and, therefore, environmental security risks. Environmental security of societal systems is affected by two kinds of interrelated conflicts: between the environment and humans, and environment related conflicts among humans. In fact, the spatial growth and persistence of environmental changes from local to national to international/trans-boundary to global has produced commensurable environmental risks in human community (from individual to global) with added temporal, intergenerational dimension.

Since at the core of environmental insecurity lie human-environment relationships it will remain until the latter is changed. Societal conflicts can be quelled or mitigated if the common understanding of parties involved is reached and solutions are found how to live under present or emerging environmental stress and ways are found of sharing its burden in an equitable way.

The management of environment related conflicts include environmental diplomacy, peaceful conflict resolution approaches, international regimes for vulnerable ecological flows and systems (stocks) such as unique ecosystems of tropical forests, Arctic, Antarctic, fish/bird migration paths, international fishery areas; use of converted military forces to handle ecorelated violence, etc. Research should be carried out to identify key intervention points where policy makers might be able to alter the causal processes linking human activity, environmental degradation, and conflict.

Parallel to these efforts mutually acceptable paths to sustainable development should be sought in common.

One approach may start with the identification of major environmental problems, principle social effects, conflict taxonomy. Environmental risks are mainly caused by increased environmental stress which is a result of population growth and environmentally unsound technological change. The latter is significantly guided by economic 'rules of the game', environmental values, environmental legislation, ecorisk perception. A change to economics of sustainable development should be pursued.

**The following definition is offered: ES is the protection (of sustainable performance of humans and societal institutions) from environmental or environment related hazards and threats thereof to security.**



**ES levels:** global, international, national, community, household, individual, intergenerational.

**ES hazards (threats):**

- (a) scarcity of environmental assets,
- (b) adverse effects of environmental changes on human health and well-being, and
- (c) environment related intra- and international tensions and conflicts.

Thus, ES deals with adverse impacts on vitally important human and societal functions and structures (flows and stocks) only, with the existence issue as the last frontier. Among them are factors that affect: territorial integrity (spread of environmental emergency areas due to land/soil erosion, sea level rise), social integrity and identity (people's health and livelihood, probability of violence or social tension due to environment related population displacement, settlement pattern change), sovereignty (uncontrolled trans-boundary, regional and global pollution/waste pervasion along natural and trade channels).

**It can be quantifiable** since insecurity factors can be identified, measured and monitored (e.g., drinking water shortage, sufficient consumption patterns, human and societal vulnerability in the face of environmental changes, threats, and risks, including changes in environment related morbidity, life expectancy). It is an essential component to achieve sustainable development.

**ES is distinct from environmental protection though inseparably linked with it.** ES presupposes the provision (in particular, conservation) or availability of sufficient environmental assets (or an equitable access to them) as well as environmental risk management. ES is also linked with other kinds of security that jointly safeguard vital functions of sustainable development, including the concern for future generations. The lack of environmental security badly affects the health, well-being, and behavior of human communities at all levels from individuals to nation states to regional to global community and leads, in particular, to social intra- and inter-national tensions. That is why ES is so important to be handled at all levels up to world governance as a long-term issue.

The system of international environmental security should include a complex of principles, legal standards, action plans and strategies, their financial, organizational, scientific, information, educational and other support aimed at joint elaboration of the concept of new environmental thinking and conduct of states. (Evtcev, S. et al., 1989)

**Thus ES is oriented at minimizing environmental damages and risks because of humans-nature and environment related humans-humans conflicts through managing:**

environmental scarcity (in terms of depletion of environmental resources, including the loss of biodiversity, by achieving ecoparity through acquiring or getting access to environmental resources on the equitable basis, creating ecoresource bufferstocks), adverse effects of environmental changes, environment related intra - and international tensions and conflicts (resulted from the direct impact of the above two factors and exacerbated by their heterogeneous perception by

countries, their uneven impact on countries and regions, a differing contribution of countries to them, a heterogeneous national/regional response and the capacity to respond to these factors, including attempts by some countries or companies to manage the two factors by taking advantages of weaker regulations, knowledge, etc. in poorer countries), environmental risks (forward looking, preventive strategy).

Thus, the management of environmental scarcity includes environmental protection measures, sustainable use of resources, and international co-operation on environmental resource transfers.

The management of environmental changes deals with: natural disasters and human induced natural disasters, unintentional changes (transboundary, regional, global environmental issues, transfer of hazardous and toxic substances through trade), intentional changes (environmental, aggression, warfare, ecoterrorism); sudden changes - e.g. industrial accidents, cumulative changes -e.g. environmental chemical 'time bombs'.

**Main environmental security threats** come from:

outside a nation-state:

premeditated action (the environment as part of military activity);

- unpremeditated action (long-range trans-boundary transport of air, water, soil pollution, regional, global environmental problems);

- within a nation-state: environmentally unsound national development leads to environment related intra-national as well as international tension and conflicts (e.g., that happens in the 1990s to Russia).

Therefore, matters of ES should be handled at the national and international levels by special institutions, e.g. environmental security councils. They should be able to make use of capabilities of various sectoral agencies that deal with environmental protection, human health, economic activities, defence, foreign affairs, etc. to lead to sustainable life-styles, production and consumption patterns.

**The following dimensions of environmental security can be considered:** socio-environmental (from global to local), international, intergenerational, interpersonal aspects. The cross-cutting issues are institutional (e.g., international environmental regimes, the role of NGOs, TNCs, public movements in decision-making, negotiations), economic (environmental economics issues), social (e.g., environmental values, perception, risk communications), political (e.g., environmental aspects of sovereignty, democracy).

## PROPOSALS FOR FURTHER STUDIES

### Subject 1. Expanded notion of security

The issues to be tackled:

specifics of GEC impact on countries, environmental factors of international insecurity, case studies of environmentally related tensions and conflicts and their effects on national and international security as well as traditional sovereignty, present Russia as a factor affecting international security, international economic relations and environmental security, international environmental security strategies, designing a system of international security and risk management.

### Subject 2. Environmental Sufficiency and Parity.

The unevenness environmental situation in countries, causes both internal and international tensions and affects their economic development (meeting human wants and needs). It is suggested that there should exist a certain minimal level of sufficiency in the environmental situation that should not give rise to or advocate conflicts. Internal and international tensions could occur if this level were not reached. In addition, it is also suggested that extremes in the environmental situation of nations should be diminished or leveled out to achieve some level of international environmental parity above or at the sufficiency level. (Parallels are drawn here to military and humanitarian as well as social security issues). International action could be required (under UN?) to meet the above two conditions which are necessary for achieving sustainable development and environmental security.

Environmental parity and sufficiency criteria, indicators, techniques to use them are to be researched into. The following levels of ecoparity are suggested: socio-environmental level (on global and local scales) to achieve global environmental security, international level for international security, intergenerational level for intergenerational security, interpersonal level to achieve individual security and rights to equal environmental security.

A UN document similar to the UN Declaration of Human Rights may be needed in the environmental area but more operationally applicable and formalized to make practical assessments of the environmental situation and its disparities in different countries.

Research topics under the ISSC Human Dimensions of Global Change Programme that is complementary to the ICSU IGBP include the area of environmental security and sustainable development. This area stresses that **environmental security should be considered as an essential component of a comprehensive concept of human security**. It raises issues concerning the organization of society and the norms that should guide individual and collective behavior. In particular, consideration of environmental security leads to questions about the interpretation of the concept of sovereignty. How free should and could states be to take actions which may have harmful environmental effects beyond their borders for future generations? Research on environmental security should analyze the prospective costs and benefits of various relevant courses of action in an unpredictable world. Issues involved in inter-personal, inter-regional, international, and inter-generational conflicts of interest must be

explored. More attention should be given to how common resources have been treated and might be protected. The great potential range of costs and benefits, many of which may be unquantifiable in monetary terms, will necessitate evolution in methodology of existing fields of social science, including the development of new concepts for inclusion in systems of economic accounting, and likely the creation of new interdisciplinary fields or emphases within disciplines, in order to consider these issues. (Jacobson,H., Price,M. ISSC, 1990.).

Naturally, **the environmental security notion cannot be static if it is oriented at sustainable development.** Therefore, there should be environmental security not only for present but also for future generations. Environmental threats could be incorporated in the proposed central early warning system. (South Centre, October 1992, p.19).

## 4. Bibliography

### Introduction

This bibliography is a work in process identifying prominent authors who have addressed environmental security and conflict on theoretical and/or empirical levels, and those leaders in the field who have authored seminal works on redefining national security. The bibliography attempts to be selective, while providing key citations for each of the major schools of thoughts. Further research is underway to identify other important resources, such as case studies, conference reports, and relevant sections of legal conventions.

It is organized in the following sections:

- 4.1 General
- 4.2 Environmental Scarcity Model
- 4.3 Economic Development and Modernization Model
- 4.4 Spillover Model
- 4.5 Sectoral Linkages Model
- 4.6 Leading Edge Model

### 4.1 GENERAL

**Brown, Lester. "Redefining Security."** Worldwatch Paper No. 14, Worldwatch Institute, Washington, DC., 1977. Argues that the conventional definition of national security should be expanded to include environmental threats resulting from resource scarcity and overpopulation. Examines five major areas of environmental security: energy, biological systems, climate modification, food insecurity, and economic threats to security. First, asserts that world oil production cannot keep pace with consumption and that the world's oil reserves will be depleted within fifteen years (i.e., by 1992) given the trends of the time. Second, claims that pressures on the earth's principle biological systems -- oceanic fisheries, grasslands, forests, and croplands - are mounting as a result of population growth. Argues that preserving these biological systems will require constraints on global consumption. Third, asserts that increasing amounts of carbon dioxide in the atmosphere are promoting a "greenhouse effect" that will raise the earth's temperature, causing a variety of ecological problems (rising sea levels, crop failure, etc.). Fourth, looks at several famines of the 1970s, including famines in Bangladesh, Ethiopia, and India, in the context of linking third-world overpopulation to growing food insecurity. Fifth, examines the impact of economic stresses such as inflation and unemployment on domestic and international instability.

**Byres, Bruce. "Ecoregions, State Sovereignty, and Conflict."** Bulletin of Peace Proposals 22:1 (1991): pp.65-76. Argues that the frequent incongruity between political and ecological boundaries has the potential to stimulate conflict and that mapping such incongruities can be a tool for predicting conflicts in time for preventive action. Further argues that preventing ecologically rooted conflicts requires some modification of state sovereignty. Posits two basic kinds of incongruities: (1) cases where two or more states share a single ecoregion, and (2) cases where single states occupy more than one ecoregion. In both cases, asserts that conflict is

stimulated because of the association between ecoregions and ethnic groups. Ethnic groups tied to ecoregions often do not have sovereignty over the territory they occupy, a situation which can exacerbate conflict. Using this logic, predicts that environmental conflict will occur (a) where ecogeographical and state boundaries do not coincide, and (b) in regions where resources can no longer support the population level. Concludes that state sovereignty should be modified, though not abandoned, in order to recognize ecogeographical realities.

**Holst, Johan J, "Security and the Environment: A Preliminary Exploration."** Bulletin of Peace Proposals, Vol 20(2) 123-128 (1989). Holst identifies three dimensions of the relationship between armed conflict and environmental deterioration; (1) environmental degradation as a consequence of armed conflict, (2) degradation as a cause of armed struggle (environmental collapse leading to famine, migration, and rebellion) and (3) environmental degradation as a contribution to armed conflict (using changes to the environment as a weapon). The third dimension, environmental manipulation as a means of waging warfare, can be employed in space, the atmosphere, the lithosphere (the land), the hydrosphere (oceans), and the biosphere. Nuclear war would cause the most dramatic manipulation and Holst emphasizes both the danger of attempting to "win" a nuclear exchange and the realization that no area would be safe from environmental harm. Deforestation is a direct consequence of population growth and together they create environmental refugees with increasing frequency. This process of degradation is self-reinforcing, but can best be contained by international management of shared and common resources.

**Homer-Dixon, Thomas. "Strategies for Studying Causation in Complex Ecological Political Systems."** Occasional Paper of the Project on Environment, Population, and Security, University of Toronto and the American Association for the Advancement of Science, June 1995.

Examines different methodological approaches to testing hypotheses of causal links between environmental scarcity and social conflict. Identifies two ways of thinking about whether and how environmental scarcity contributes to conflict: the rational actor approach, which examines how scarcity influences decision makers, and the causal relationship approach, which focuses on the nature of the hypothesized relationship between the cause (environmental scarcity) and its effect (social conflict). Argues that, especially in early stages of research, researchers would be best served by empirically testing cases along both the independent and the dependent variable (i.e., examining cases where both environmental scarcity and social conflict are present). This method enables researchers to determine if the independent and dependent variables are linked, and if they are, to induce patterns of causality and locate the key intermediate variables that characterize the links. Asserts that more traditional approaches to hypothesis testing, such as correlational analysis and controlled-case comparisons, are not adequate for grasping the complexity of the relationship between environmental scarcity and social conflict, especially in the early stages of research.

\_\_\_\_\_. **"Population Growth and Conflict."** Paper presented at American Academy for the Advancement of Science Annual Symposium, 9 February 1992. Focuses on the relationship between population growth and conflict. Introduces six causal models describing this relationship: 1) Overflow Model states that when an area becomes overpopulated, people spill out, causing conflict. Homer-Dixon calls this model too simplistic; 2) Lateral Pressure Model describes causal relationship between population and international conflict using four variables --

population, level of technological development, domestic resource availability, external resource availability; 3) Differential Growth Model explains how domestic conflict can be caused by population growth. Uses example of one ethnic group in a country reproducing faster than another group, leading to conflict (e.g., Palestinians and Israelis); 4) Environmental Change Model suggests population multiplied by per capita use of the range of technologies available in the society produces certain environmental and social effects, and perhaps conflict; 5) Resource Competition Model adds to model four the idea that population growth and inequitable distribution of resources can directly cause competition over resources which can lead to conflict; 6) State Capacity Factors Model applies to early modern states. Argues that rapid population growth drains state resources, leads to competition among elites for power, contributes to breakdown of state structures, all of which cause conflict.

**Libiszewski, Stephan. "What is an Environmental Conflict?"** Occasional Paper No. 1, Environment and Conflicts Project, Swiss Peace Foundation, Berne, and Center for Security Studies and Conflict Research, Zurich, Switzerland, July 1992. Defines the term environmental in the context of conflict research and illustrates how the causal linkage between ecology and the environment should be seen. Distinguishes between renewable and non-renewable resources and the types of scarcity. Defines conflict and the environmental origins of conflict. Concludes with the definition of environmental conflicts as those induced by an environmental degradation involving the overuse of renewable resources, overstrain of the environment's sink capacity, and the impoverishment of the space for living.

**Mathews, Jessica Tuchman. "Redefining Security."** *Foreign Affairs* 68 (Spring 1989): pp. 162-77. Argues that a new concept of "security" is needed, one that recognizes that environmental decline can occasionally lead directly to conflict. Contends that rapid population growth is the main catalyst for environmental instability and the social instability which follows. Downward pull on economic performance from environmental degradation and population pressures leads to frustration, resentment, domestic unrest, and in extreme cases, civil war, making environmental causes an "essential factor" in conflict. Most serious threats from deforestation in tropics, desertification, and patterns of land tenure. Cites deforestation and fish stock depletion in Philippines, sub-Saharan African deforestation. Reviews projected global environmental situation in 2050, and recommends: a) new methods for valuing national income accounts to reflect resource depletion, b) indicators by which global health can be measured; c) new tools for development assistance, including increasing roles for NGOs; and d) emphasis on multilateral diplomacy, including new ways to negotiate successfully, and a key role for private sector.

**Porter, Gareth. "Environmental Security as a National Security Issue,"** *Current History* 94:21 (May 1995). Presents Environmental Security issues as a new and vital element of National Security that will redefine traditional policies. Examines environmental degradation as a potential cause of violent conflict that can be avoided only through cooperative solutions. Cites the inadequacy of nation-state responses to this global issue and illustrates the slow growth of awareness of environmental threats compared to military threats. Identifies global physical changes, including the destruction of the ozone layer, global warming, and biodiversity, as representative of the types of degradation that are potentially worse security threats than traditional military conflicts. Environmental Security must focus on protecting renewable

resources from depletion, which can be both a direct objective and an indirect cause of conflict. Conflicts fueled by the degradation of renewable resources, population growth, and unequal resource distribution are likely to increase in frequency. Recognizes the Clinton administration for its incorporation of Environmental Security issues into National Security Policy.

**Schrijver, Nico, "International Organization for Environmental Security",** Bulletin of Peace Proposals, Vol. 20(2): 115-122. Paper presented at the international symposium, "Towards a Comprehensive System of International Security", Moscow, December, 1988. Schrijver presents three proposals, or approaches, for addressing environmental security issues through international organizations. The first is the reformist approach, which would require the rejuvenation or restructuring of existing institutions. These would include the UN Security Council, the Trusteeship Council, the Economic and Social Council (ECOSOC), the International Court of Justice, the Permanent Court of Arbitration, and the UN Environment Program (UNEP). The problems inherent to a reformist approach involve the need to either alter the original UN Charter or build on organizations that have proven to be ineffective in the past. The second approach requires the establishment of new organizations. These include an Environmental Security Council, an Economic Security Council, upgrading the UNEP to a specialized agency, and creating Green UN Police Forces or a Green Cross. This approach is aptly named idealistic because the formation of these organizations would need funding that does not yet exist and grant unprecedented authority to international organizations. The last approach is the pragmatic, incorporating elements of the previous two. Proposals include the revitalization of ECOSOC through a new governing board, the strengthening of the UNEP without changing the UN Charter, and the creation of an International Environmental Commissioner out of the office of the UNEP's Executive Director. Schrijver argues that these pragmatic steps combined could provide the means for collective environmental security.

**Spector, Bertram I. "Environmental Conflicts: Potential Threats to U.S. Interests,"** typescript, March 1995. Focusing on the Pacific rim, the feasibility study identifies the escalating frequency of overseas environmental conflicts, their impact on US interests, and means for addressing these issues. Population pressures and transboundary pollution are both characteristic of the region and rapid industrialization contributes to the problem. The increased potential for conflict directly threatens US citizens, military personnel, and business interests in affected regions. Early detection can reduce or eliminate future risk. The proposed data base would involve the means for crisis identification, data collection, analysis, preliminary design of early warning indicators, and the identification of potential threats.

**Spector, Sjostedt, and Zartman, "The Dynamics of Regime Building,"** in *Negotiating International Regimes: Lessons Learned from the United Nations Conference on Environment and Development (UNCED)*, eds. B. Spector, G. Sjostedt, and I.W. Zartman. London: Graham and Trotman, 1994. Analyzes the UNCED process as a prime example of how international regimes are negotiated. Asserts that UNCED succeeded in formatting an umbrella regime in the field of sustainable development that will continue into the future and spawn sub-regimes in particular environmental sectors. Summarizes the characteristics of multilateral negotiations and the basic process of regime building. Describes multilateral negotiations as: multi-party, multi-issue, characterized by coalitions and consensus, multi-role, and rule-making rather than redistributionist. Describes five behavior types for actors negotiating international regimes:



drive, conduct, defend, brake, cruise. Discusses the role of flexibility in successful negotiations. Discusses the dynamics of framing key issues and the role of non-stakeholders and third party actors in providing research and analysis to aid this process. The negotiation process results in incremental clarification of national interests and objectives which eventually leads to consensus.

\_\_\_\_\_, **Laurie J. MacNamara, Richard E. Hayes, and Kenneth E. Kaizer. "Strategies and Coalition Building in International Environmental Security,"** typescript, January 1996. Outlines some of the major schools of thought on the meaning of environmental security and approaches to policy options. Environmental security can be defined as the protection of armed forces from environmental threats, or, more accurately, as the response to non-military environmental threats to national security. These can be both intentionally generated or unintentionally caused, but in each case environmental threats jeopardize the quality of life of a population and trigger political and social unrest. Scarcity and uneven distribution lead to environmental disputes and the frequency of such conflicts is likely to escalate in the future. Differing approaches to environmental security issues include the environmental scarcity, economic development and modernization, spillover, sectoral linkages, and leading edge models. Indicator systems, as well as preventive and containment responses are analyzed as policy options.

**Starr, Joyce. "Water Wars." Foreign Policy (Spring 1991):** pp. 17-36. Examines the "water crisis" in the Middle East and North Africa. Asserts that, despite evidence that the region is approaching dangerous water shortages and contamination, Western leaders have so far failed to treat the issue as a strategic priority. Discusses water management regimes in Middle Eastern countries, calling such regimes ineffective if they are not coupled with greater cooperation among countries. Points out the fact that waste treatment centers and desalinization plants will likely be strategic targets in future conflicts. Discusses the countries relying on the Nile for water and highlights the potential economic and political dangers Egypt could face as a result of drought or interference by upstream countries. Discusses Israel's water concerns in the West Bank and asserts that 25-40 percent of Israel's water comes from the Occupied Territories. Contends that Turkey, which has an abundance of water, can serve as a balancing force in the Middle East. Similarly, calls on the United States to play a leading role in addressing the emerging water crisis. Advocates fully tapping existing expertise within the U.S. government in the area of creating water assistance programs.

**Ullman, Richard H. "Redefining Security." International Security 8 (Summer 1983):** pp. 129-53.

Considered by many to be the seminal article in redefining the concept of "security." Seeks to shift the focus of states away from a definition of security which relies on militaristic aspects alone. Discusses the choices one makes between security and liberty, and the social and moral implications of the choice, to include; human rights versus state security, collaboration with despotic states, military aid versus economic aid, and domestic needs versus international interests. Redefines threats as an action or sequence of events that, over a short period of time, threaten to alter the quality of life within the state or to significantly narrow the state's range of policy choices. These threats can include: natural disasters, territorial and resource conflicts, and depleted supply-side resources. Proposes a fundamental shift in the conception of security, to include public education and reallocation of resources, and the roles for both governmental and

nongovernmental agencies.

**Westing, Arthur. "An Expanded Concept of International Security,"** in *Global Resources and International Conflict: Environmental Factors in Strategic Policy and Action*, ed. Arthur H. Westing. Oxford: Oxford University Press, 1986: pp. 85-113. Addresses (a) means for reducing the likelihood of international conflict over natural resources; and (b) environmental measures for strengthening international security. Divides the resources over which war can be fought into three categories: territorial resources, shared resources, and extra-territorial resources. Asserts that the prevention of wars waged over territorial resources (i.e., when one state invades another to capture its resources) is clearly subsumed under the broader international prohibitions on aggression and violations of territorial integrity. Notes that conflict over territorial resources can also take the form of domestic instability - for example, coups d'etat. Discusses shared resources - which include fresh waters, ocean fisheries, and the atmosphere - the their potential for causing conflict. Calls for the creation of a more comprehensive body of international law to deal with these kinds of conflicts. Extra-territorial resources include the oceans, the sea beds beneath them, outer space, and the moon. Claims that there is a significant potential for conflict over these resources as human technological capacity develops. Finally, discusses extent to which an amelioration of environmental problems would lead to a reduced threat of military conflict in the world. Advocates the "common heritage of mankind" principle -- the concept that the earth and its natural resources belong to all and must be managed for the benefit of all. Calls for restraint in the use of renewable resources and curbs on world population growth. Also outlines several steps to curb dependency on fossil fuels and non-renewable resources.

\_\_\_\_\_. "**The Environmental Component of Comprehensive Security**", *Bulletin of Peace Proposals*, Vol. 20 (2): 129-134 (1988). Paper originally presented the international symposium 'Towards a Comprehensive System of International Security' Moscow, December 1988. Westing likens environmental security to political security in terms of the essential factors of maintaining national, regional, and global comprehensive security. He details two means of sustaining that security through providing for both the protection and sustained utilization of renewable resources. Protection entails avoidance of vandalism (acts of war, deforestation, etc.) and avoidance of excessive pollution. Sustained utilization requires an avoidance of consuming resources at a rate beyond long-term sustainability and avoidance of consumption altogether in cases of past abuses. Only an inflexible commitment to these rules will guarantee environmental security. The Horn of Africa is used as a example of an ecogeographical region where most nations do not adhere to international norms in avoiding vandalism or reducing pollution.

#### 4.2 ENVIRONMENTAL SCARCITY MODEL

**Fallenmark, Malin. "Fresh Waters as a Factor in Strategic Policy and Action,"** in *Global Resources and International Conflict: Environmental Factors in Strategic Policy and Action*, ed. Arthur H. Westing. Oxford: Oxford University Press, 1986: pp. 85-113. Discusses fresh water as a present and future focus of international disputes and as a factor in conflict formation. Gives examples of typical disputes. Discusses the potential for international tension resulting from problems of freshwater supply. Summarizes efforts in conflict resolution and prevention, with a focus on current progress towards an internationally agreed code of conduct. Asserts that a

secured supply of water and control of river flow must be cornerstones in national planning and development. Foresees that large increases in water for irrigation will be necessary in those countries striving toward increased self-sufficiency in food production which are simultaneously facing rapid population growth. Discusses water disputes arising among states in three river basins: the Jordan (Israel, Jordan, Lebanon, Syria), the Ganges (Bangladesh and India), and the Nile (Egypt, Ethiopia, Sudan). Examines several existing conflict prevention conventions. Advocates codifying rules and norms for solving water disputes as they emerge. Discusses United Nations water management actions and international river commissions as two attempts at water conflict prevention.

**Gleick, Peter H. "Water and Conflict: Fresh Water Resources and International Security."** *International Security* 18 (1993): pp. 79-112. Links the competition for water as a resource to violent conflict through historical examples. As a critical factor to the quality of life, increased competition for water has produced tensions among national and sub-national groups that have led to conflicts. Water has been a source of tension when it was a military goal (95% of the Nile's runoff originates outside Egypt, but it supplies 97% of Egypt's water), a military target (destruction of Iraqi and Kuwaiti desalinization plants during the Persian Gulf War), and it has been a military means (Turkey's Attaturk dam raised protests from Syria and Iraq). Concludes that inequities in water resources and hydrologic conditions will remain a potential cause of future conflicts.

**Gurr, Ted Robert. "On the Political Consequences of Scarcity and Economic Decline,"** *International Studies Quarterly* 29 (1985): pp. 51-75. Criticizes the relative neglect of political analysis in most of the literature on global resource scarcity and the ecological crisis. Proposes that resource scarcity creates greater material inequalities within and among societies, intensifies internal and international conflict, and causes shifts from open toward more closed and authoritarian political institutions. Cites historical and contemporary evidence in support of the argument. Contrasts national policy responses which facilitate accommodation to ecological limits with pro-growth policies. Essay seeks to qualify both the political optimism of ecological analysts and the technological optimism of the proponents of further growth.

**Homer-Dixon, Thomas. "On the Threshold: Environmental Changes as Causes of Acute Conflict."** *International Security* 16 (Fall 1991): pp. 76-116. Key article in theoretical literature on scarcity-conflict linkages. Focuses on how environmental crises play a role in the causes of "acute" conflict, defined as "conflict involving a substantial probability of violence", and how to improve the research methodologies used in analyses. Discusses the difficulties involved in analyzing the linkages between the environment and conflict, to include; an overemphasis on human induced changes, anecdotal writing on the links, lack of empirical data on direct causation, a prevailing "naturalistic" epistemology, the multi-disciplinary needs for analysis, and a lack of emphasis on transboundary environmental problems. Proposes a frame work to create a causal-path analysis of the linkages between the environment and conflict. Identifies the major environmental problems facing developing countries as being; greenhouse warming, ozone depletion, acid rain, deforestation, degradation of arable land, water pollution, and a depletion of fish stocks. The article further identifies the social effects of these environmental problems to be; decreased agricultural production, economic decline, population displacement, and the disruption of stable social and institutional practices. Finally, the article illustrates the types of conflicts and their objectives and scope that arise from the environmentally induced social crises.

**Lipschutz, Ronnie D. "What Resources Will Matter? Environmental Degradation as a Security Issue."** Paper presented at American Academy for the Advancement of Science Annual Symposium, 9 February 1992. Argues that environmental problems are not a primary cause of conflict and it is not useful to think of environmental degradation as a security issue. Asserts that there are some circumstances when environmental degradation might threaten the security of states, the countries most likely to be affected are likely to be in "dismal shape." Degradation will primarily affect developing countries that are already weakened by non-environmental factors and lack the flexibility to respond to environmental stresses. Degradation might contribute to a state's internal instability, but is not likely to cause international instability. Claims that resource disputes are not significant causes of international conflict, and are primarily the result of underlying tensions or hostilities that already exist. States that what scholars label "resource wars" are actually complex situations in which material conditions are simply the most visible of a larger set of causes. Argues that the tools of national security are inappropriate for addressing environmental degradation. Concludes that environmental degradation is a question of social security and social welfare affecting the lives of individuals and societies, but not a national security problem.

**Lowi, Miriam R. "West Bank Water Resources and the Resolution of Conflict in the Middle East."** Occasional Paper of the Project on Environmental Change and Acute Conflict, American Academy of Arts and Sciences, Cambridge, MA, 1992. Argues that both real and perceived threats to a nation's vital resources have played a major role in Arab-Israeli conflicts. Lowi discards traditional "power analysis" in favor of an awareness of increasing insecurity among all states. Author identifies the need for a new approach that entails the recognition of the need to protect core resources from degradation and the need for states to reduce their vulnerability in terms of dependence on threatened resources. Specific circumstances link water distribution to regional stability. Israel's national goal of agricultural development has sharply restricted the water drilling rights of Arabs living in the West Bank. The highly inequitable distribution has stemmed from political rivalry and the author cites efforts to resolve allocation imbalance as critical to regional peace efforts. Recommendations for just distribution include the formation of an independent international panel of experts, approved by both sides, to determine and monitor just allocation of scarce resources.

**Mathews, Jessica Tuchman. "Preserving the Global Environment."** in *The Future of American Foreign Policy*, ed. Eugene R. Wittkopf. New York: St. Martin's Press, 1994. Describes two broad political strategies for promoting collective environmental problem solving at the international level. One, the "quantum leap approach," emphasizes the immensity of the problems and urges "vast bold policy leaps" to capture attention and to galvanize support for action. The other, the "ambitious incrementalism approach," emphasizes the relatively modest steps needed to "weave environmental concerns into the fabric of mainstream economic and foreign policy." Concludes that the latter strategy is more likely to permanently change the policy context. Suggests several steps the U.S. must take to exercise a leadership role in this area in the future, such as improving its environmental productivity by reducing the use of natural resources and the consumption of environmental services per unit of economic output.

**Naff, Thomas. "Water Scarcity, Resource Management, and Conflict in the Middle East."**

Paper presented at American Academy for the Advancement of Science Annual Symposium, 9 February 1992. Focuses on the water consumption and supply of the states of the Jordan river basin; i.e., Jordan, Israel, Syria, Lebanon, and the Occupied Territories. Forecasts persistent water shortages in the future since the basin will sustain 12 to 14 million people and the population of the region will exceed that number by 3 to 4 million over the next two decades. As a result, forecasts heightened external and internal competition in these countries for decreasing amounts of water. This competition will most likely take the form of internal civil disorder rather than "water wars" between states. Asserts that Israel's hydrological concerns in the Occupied Territories outweigh its ideological and security concerns since 40% of Israel's water originates in the occupied West Bank. Proposes several solutions to ameliorate water shortages, including: the creation of a basin-wide water authority and restructuring basin economies away from heavily irrigated agriculture toward other sectors like electronics, services, and light industry.

**Opschoor, Johannes B. "North-South Trade, Resource Degradations and Economic Security"**, *Bulletin of Peace Proposals*, Vol 20 (2): 135-142 (1989). Paper presented at the international symposium; 'Towards a Comprehensive System of International Security' in Moscow, December 1988. Concerns the potential for economic and political regional instability resulting from the exhaustion of natural resources by developing nations. Opschoor defines such conditions as environmental insecurity, identifies the circumstances that contribute to the phenomenon, provides examples from developing nations, and suggests means of halting the current trend. Circumstances include (1) the overexploitation of domestic, shared, and common resources by developing nations in an effort to channel "hard" currencies into failed economies and (2) ecological stress stemming from insufficient pollution control of industry causing transnational environmental damage. Example case studies from Thailand, Brazil, and Malaysia demonstrated a common tendency for developing nations to cause long-term irreparable damage to the regional environment in exchange for short-term economic gain. Means of halting trend entailed implementing patterns of resource utilization to sustain environmental, economic, and political security. These patterns would be established and maintained through global awareness, resource-saving technology, and greater regional environmental management through enhanced international institutions.

#### 4.3 ECONOMIC DEVELOPMENT AND MODERNIZATION MODEL

**Holdren, John P. "Energy and International Security."** Paper presented at American Academy for the Advancement of Science Annual Symposium, 9 February 1992. States that there are two directions of energy-security interactions: ways in which energy choices affect security problems, and ways in which security choices affect energy problems. Focuses on three issues: the potential for conflict over oil in the Persian Gulf in the context of the 1991 Gulf War, the relationship between nuclear energy and nuclear weapons, and the "energy-environment-development nexus." Concludes that many concerns other than oil drove Saddam's decision to invade Kuwait and the response of the international community. Argues that the danger of conflict over oil is dwindling over time. Proposes several arrangements to strengthen international supervision and control over nuclear energy facilities, including international inspection without warning and multinational guarding of all plutonium shipments. Asserts that the failure to address the "energy-environment-development nexus" will have adverse

consequences for security. Proposes a five point energy strategy which entails: increasing the efficiency of energy end use, reducing the environmental impacts of today's energy sources, facilitating the transition to more sustainable energy options, expanding international cooperation and assistance programs, and halting the growth of the world's population at 10 billion or fewer.

#### 4.4 SPILLOVER MODEL

**Lipschutz, Ronnie D., and John P. Holdren. "Crossing Borders: Resource Flows, the Global Environment, and International Security." Bulletin of Peace Proposals 21 (1990): pp. 121-33.**

Focuses on the threat to international security posed by the degradation of the planetary environment. Asserts that conflicts over mineral resources (including oil) have been rare in the past and are likely to be rare in the future since the costs of military action are high, the chances of succeeding in a military venture to protect access to a threatened resource are extremely low, and the alternatives to protecting access are much more promising. On the other hand, argues that large scale environmental degradation is likely to pose a grave threat to international security in the future. Asserts that the four most prominent environmental problems in this category are: (1) climate change due to "anthropogenic additions to the atmosphere's stock of infrared absorbing trace gases;" (2) contamination of the stratosphere with substances that destroy ozone; (3) acid precipitation; (4) destruction of tropical forests. Notes that countries bearing the severest impact of biogeophysical change may feel that these damages were inflicted upon them by the irresponsible actions of other nations. Concludes that "the resulting resentments can hardly fail to aggravate international tensions." Locates these conflicts within the context of growing tension between the industrial North and the less-developed South. Finally, advocates superpower cooperation to forestall such catastrophes. Calls for redirecting one third of the U.S. defense budget to conservation efforts and public works projects to alter the world's pattern of energy consumption.

**Molvaer, Reidulf K. "Environmentally Induced Conflicts?: A Discussion Based on Studies for the Horn of Africa." Bulletin of Peace Proposals 22 (1991): pp.175-88.** Seeks to determine whether environmental degradation can lead to social tension, social disruption and armed conflict. Focuses on the possibility that "people may cease to feel secure" because of factors in their environmental surroundings. Examines the situation in Somalia. Asserts that because of environmental degradation, the various pastoral groups are not able to move over vast areas as before. Consequently, competition for water and grazing lands has increased, and conflicts between these pastoral groups have intensified. Also ties pastoral roaming following environmental degradation to the 1977-78 war between Somalia and Ethiopia. Asserts that a second source of conflict in the Horn of Africa is conflict between agriculturalists and pastoralists, which arises when pastoralists are forced to abandon their traditional lands as a result of environmental degradation. The pastoralists then settle in land traditionally occupied by agriculturalists, leading to conflict between these two groups. Similarly, asserts that conflict also arises when agriculturalists or pastoralists are forced to abandon their lands and move to cities. Concludes by stating that should environmental stress and food shortages increase, more people will perceive such stresses as threats to their way of life, leading to greater environmental wars.

**Myers, Norman. "Environment and Security." Foreign Policy 74 (Spring 1989): pp. 23-41.**

Focuses on the inexperience of the United States in recognizing and dealing with environmental linkages to foreign policy, and the inadequate development of the Third World as the issues which he sees to be the most prominent problems in the immediate future of the environment and political stability. Claims that Third World economic decline resulting from environmental degradation leads to limited sustainable growth, with important ramifications for the U.S. - dampening of U.S. exports, limiting loan repayments, and destabilizing political systems that could lead to civil turmoil and violent conflict. Case studies cited include deforestation in the Philippines, land degradation in El Salvador, Middle East water deficits, and rapid population growth in Mexico. After illustrating his thesis with these several case studies, proposes several steps which should be taken by the U.S. in dealing with the environment as a security issue, including; a basic shift in focus by the U.S. to better understand environmental and political linkages, the diversion of a greater portion of foreign assistance towards technologies dealing with environmental concerns and away from traditional military activities, and environmental criteria in international lending institutions' activities.

#### 4.5 SECTORAL LINKAGES MODEL

**Gizewski, Peter. "Data Survey: Population, Environment, and Acute Conflict."** Fast Track Project, The Peace and Conflict Studies Program, University of Toronto and the American Association for the Advancement of Science, March 1995. Lists relevant data sources in five areas: 1) Information detailing the physical characteristics of various regions and the countries occupying them; 2) Data that reflect human impacts on the environment; 3) Data indicating national development; 4) Information that taps the socio-political character of states and their operation, and 5) Data on interstate and intrastate conflict.

#### 4.6 LEADING EDGE MODEL

**Bosnjakovic, Branko. "Environmental Issues and Political Conflicts in Central and Eastern Europe: A Two-Way Road."** Paper presented at "GeoPolitics of the Environment and the New World Order: Limits, Conflicts, Insecurity?" SORISTEC, Chantilly, France, January 1993.

Discusses transboundary environmental problems in Eastern Europe as being perpetuated by a lack of monitoring and reporting mechanisms, and that future cooperation on environmental issues is difficult in the area because of social and political conflicts. Gives areas of concern to include: maritime pollution and degradation, air pollution, hazardous wastes, nuclear risks, environmental damage at former Soviet military installations, and the damage brought about by military conflicts. Uses a matrix to display the relationship between political tensions and a negative environmental impact in specific areas. Argues for a resolution of political tensions as the most advantageous solution to Eastern Europe's transboundary environmental problems. Sees the role of western countries as that of a stabilizing force between military rivals in the area to allow for a dialogue between political rivals, and also to provide the technology needed to directly impact the environmental concerns in these areas.

**Goldstone, Jack A. "Imminent Political Conflicts Arising from China's Environmental Crises."** Occasional Paper of the Project on Environmental Change and Acute Conflict, University of Toronto and the American Academy of Arts and Sciences, December 1992.

Focuses on China's massive peasant population and its negatively disproportionate amount of arable land as the overwhelming environmental problem facing that country today, as it has throughout its history. The environmental crises of air and water pollution, soil erosion, and depleted resources all stem from this basic imbalance. Discusses the vulnerabilities of the current Chinese state which has its roots in these environmental and economic crises. These vulnerabilities include; a fractured Party leadership, rifts between Party and non-Party elites, a decline in state control of societal events, and diminishing support in its peasant and worker base. Sees the imminent collapse of Party control in China, and suggests that rapid democratization while the Party leadership still has some control, may be the only solution to China's future crises.

**Smil, Vaclav. "Environmental Change as a Source of Conflict and Economic Losses in China."** Occasional Paper of the Project on Environmental Change and Acute Conflict, University of Toronto and the American Academy of Arts and Sciences, December 1992.

Recognizes that although the primary causes of internal conflict in China to be the struggles over internal control and the direction of the country's economic policies, there is a growing emphasis on environmental degradation as another (if not underlying) source of conflict. Focuses on the newer environmental challenges of water shortages, and industrial and agricultural pollution brought on by a highly concentrated and localized population growth, combined with the existing problems of deforestation and soil erosion, as the source of numerous conflicts and economic strife. Gives examples of conflicts (familial, city, rural, and provincial) and costs (environmental pollution and ecosystemic degradation) that represent the current and future areas of conflict in China. Further sees no hope in the future without a massive increase in literacy and educational opportunities within the population and a decrease in the demand on resources from the population.

Source: NATO-ECHS. Web Site Administrator is available via e-mail at: [webstar@ech.sida.org](mailto:webstar@ech.sida.org)

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