

ENVIRONMENTAL SECURITY AND ENGAGEMENT IN CENTRAL COMMAND

**Colonel Alan L. Moloff, MC
August 2000**

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13. ABSTRACT (Maximum 200 words) Both the National Security Strategy and the National Military Strategy refer to the environment as an important issue and emphasize engagement as a critical method for achieving U.S. security objectives. This paper focuses on the Central Command (CENTCOM) area of responsibility (AOR) and discusses ways in which environmental security (ES) and peacetime engagement can be integrated to promote regional stability and enhance U.S. security. The paper proposes specific ways of leveraging ES issues to initiate or continue a variety of non-threatening bilateral or multilateral engagement activities, thus enhancing communication and cooperation between the U.S. and the nations in the CENTCOM AOR and furthering the welfare and security of the U.S. The CENTCOM theater engagement plan is reviewed with a focus on U.S. security objectives that can be aided or achieved using ES issues. Specific ES issues within the AOR are then briefly presented and analyzed. This is followed by a discussion of Department of Defense (DOD) and non-DOD organizations that can and should interact to achieve an effective ES engagement policy. Finally, the paper provides a comprehensive, multidisciplinary ES "activities menu" that can be used to enhance the overall engagement plan, minimize transboundary ES threats and achieve U.S. security objectives.			
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ABSTRACT

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This research paper looks at the relationship between environmental security (ES) and peacetime engagement and discusses ways in which these can be integrated to promote regional stability and enhance U.S. security. The paper begins by noting that both the National Security Strategy (NSS) and the National Military Strategy (NMS) refer to the environment as an important issue and emphasize engagement as a critical method for achieving U.S. security objectives. After providing an overview of the broad concepts of ES and engagement, the paper focuses on the Central Command (CENTCOM) area of responsibility (AOR), which encompasses four sub-regions: the Arabian Peninsula and Iraq; the Horn of Africa; the Northern Red Sea; and South and Central Asia. The environment and ES issues are critical to the quality of life in and long-term economic and political stability of the nations in this AOR. Prevention or mitigation of ES-related regional instability and transboundary threats will enhance the welfare and security of the U.S. This paper proposes specific ways of leveraging ES issues to initiate or continue a variety of non-threatening bilateral or multilateral engagement activities, thus enhancing communication and cooperation between the U.S. and the nations in the CENTCOM AOR. The CENTCOM theater engagement plan (TEP) is reviewed with a focus on U.S. security

objectives that can be aided or achieved using ES issues. Specific ES issues within the AOR are then briefly presented and analyzed. This is followed by a discussion of Department of Defense (DOD) and non-DOD organizations that can and should interact to achieve an effective ES engagement policy. Finally, the paper provides a comprehensive, multidisciplinary ES “activities menu” that can be used to enhance the overall engagement plan, minimize transboundary ES threats and achieve U.S. security objectives.

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ACRONYMS

AEPI	Army Environmental Policy Institute
AOR	Area of Responsibility
CENTCOM	Central Command
CINC	Commander in Chief
DA	Department of the Army
DOD	Department of Defense
DOS	Department of State
EUCOM	European Command
NSS	National Security Strategy
NMS	National Military Strategy
NGO	Non-Governmental Organization
PVO	Private Volunteer Organization
TEP	Theater Engagement Plan
USAID	U.S. Agency for International Development
USAWC	U.S. Army War College
WMD	Weapons of Mass Destruction

1. INTRODUCTION

Decisions today regarding the environment and natural resources can affect our security for generations. Environmental threats do not heed national borders and can pose long-term dangers to our security and well-being. Natural resource scarcities can trigger and exacerbate conflict.

National Security Strategy¹

This paper is not about the traditional aspects of environmental protection and it is not about domestic environmental policy.

This paper is about the use of environmental issues as part of an engagement policy to promote strategic U.S. objectives; improve quality of life and economy within a nation; enhance regional stability by assisting in regional environmental issues; and strengthen U.S. security by minimizing transboundary environmental threats. The paper focuses on the Central Command (CENTCOM) Area of Responsibility (AOR)—which encompasses four sub-regions: the Arabian Peninsula and Iraq; the Horn of Africa; the Northern Red Sea; and South and Central Asia—and demonstrates how environmental issues can be used as part of a theater engagement plan (TEP) to improve bilateral and multilateral understanding and enhance regional stability.

2. NATIONAL STRATEGY

Since the end of the Cold War and the breakup of the Soviet Union there have been sweeping changes in our views and our policies regarding national security concerns and challenges and the ways and means to achieve the desired end-state.

The National Security Strategy (NSS) frequently refers to both the environment and engagement. In fact, the importance of these two concepts is clearly stated in the introduction to the NSS:

Other problems that once seemed quite distant—such as resource depletion, rapid population growth, environmental damage, new infectious diseases and uncontrolled refugee migration—have important implications for American security.

American leadership and engagement in the world are vital for our security, and our nation and the world are safer and more prosperous as a result.

We must be prepared and willing to use all appropriate instruments of national power to influence the actions of other states and non-state actors.

We seek a cleaner global environment to protect the health and well-being of our citizens. A deteriorating environment not only threatens public health, it impedes economic growth and can generate tensions that threaten international stability.²

There is no specific use of the term “environmental security” or discussion of how the environment relates to engagement policy. Nevertheless, both the environment and engagement are discussed as important—although distinct and separate—issues. The NSS also contains many statements that make reference to how a stable or improved environmental situation can serve as a catalyst for improving regional and international stability as well as statements that discuss how deteriorating environmental conditions could lead to regional

instability. Among the environmentally related goals proposed by the NSS is that of increasing compliance with regard to various agreements and treaties, such as the 1997 Kyoto Agreement, the Montreal Protocol, the Law of the Sea Convention, the 1994 Cairo Conference, the Convention to Combat Desertification and the Biodiversity Convention, to name a few.

NSS objectives in the CENTCOM AOR are diverse due to the wide range of geographic areas and political situations involved. In general, the objectives are: to deter threats to regional stability, to counter threats from weapons of mass destruction, to protect the security of our regional partners, and to ensure the free flow of oil and promote prosperity.³

The National Military Strategy (NMS) describes peacetime engagement as “all military activities involving other nations intended to shape the security environment in peacetime. Engagement serves to demonstrate our commitment; improve interoperability; reassure allies, friends and coalition partners; promote transparency; convey democratic ideals; deter aggression; and help relieve sources of instability before they can become military crises.”⁴ Unfortunately, the NMS contains no statements that relate environmental issues or environmental security to an engagement plan.

What follows provides an overview of the concepts of environmental security (ES) and engagement and then, by focusing on the CENTCOM AOR, shows how environmental issues can be integrated into a theater engagement plan.

3. ENVIRONMENTAL ISSUES AND ENVIRONMENTAL SECURITY

[L]ocal or regional instability, arising from a combination of environmental, resource and political factors, may escalate to the international level and may become violent. Thus, it is imperative to clarify the terms of the debate, and to identify and analyze those cases in which environmental variables threaten security.

Peter Gleick⁵

While concerns about the environment have existed in some form or another throughout history, environmental concerns were not discussed seriously until the 1960s. The precipitating event was Rachel Carson's book *Silent Spring*.⁶

In the decades that followed, there was some discussion and debate regarding how environmental issues or crises could relate to foreign policy and national security. It was not until 1991, however, that the relationship between environmental issues and national security began to come into clear focus. In 1991 President Bush added a statement on environmental issues to the National Security Strategy⁷ and Thomas Homer-Dixon published his paper "On the Threshold: Environmental Changes as Causes of Acute Conflict." Homer-Dixon's thesis is that:

[P]oor countries will in general be more vulnerable to environmental change than rich ones; therefore, environmentally induced conflicts are likely to rise first in the developing world. In these countries, a range of atmospheric, terrestrial, and aquatic environmental pressures will in time probably produce, either singly or in combination, four main, causally interrelated social effects: reduced agricultural production, economic decline, population displacement and disruption of regular and legitimized social relations. These social effects in turn may cause several specific types of acute conflict, including scarcity disputes between countries, clashes between eth-

nic groups, and civil strife and insurgency, each with potentially serious repercussions for the security interests of the developed world.

F. Homer-Dixon⁸

3.1. Defining Environmental Security

“Environmental security” is still a vague, ill-defined and imprecise term, in part because there are no accurate consensus definitions. Most of the traditional definitions focus on the preservation, remediation or security of the environment. Newer definitions discuss the relationship of people and national power to the environment.

Further, ES represents significantly different ideas and concepts to different governments, organizations and individuals. Most often organizations and individuals craft a definition or description that supports their area of concern, interest or particular agenda. There is no standard Department of Defense (DOD) or Department of the Army (DA) definition of the term.

DOD Directive 4715.1, Environmental Security, focuses on the applicability and scope of overarching policies to support the environment. The “definition” of ES in this document is more a policy statement and description of programs focused on environmental protection than a true definition.

Environmental Security – 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 [descriptions of specific programs]...⁹

Ms. Sherri Goodman, Deputy Under Secretary of Defense for Environmental Security, described ES in testimony before the Senate Armed Services Committee in terms related to the Secretary of Defense’s Shape, Respond and Prepare strategy:

SHAPE the international environment in ways favorable to U.S. interests, promoting regional stability through military to military cooperation

RESPOND by supporting critical environmental and health requirements for military operations

PREPARE by sustaining access to land, air and sea for training through responsible management of our installations and training land¹⁰

In an effort to arrive at an appropriate definition of ES, a study was conducted by the Millennium Project of the American Council for the United Nations University in 1998. The study found that there was no concise consensus definition but that there were some common elements in various definitions of ES. These common elements include:

- Public safety from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement or design
- Amelioration of natural resource scarcity
- Maintenance of a healthy environment
- Amelioration of environmental degradation
- Prevention of social disorder and conflict (promotion of social stability)¹¹

Imprecise, disparate definitions of the term “environmental security” lead to significant confusion domestically and internationally. This confusion is exacerbated by the different if not conflicting ways in which environmentalists and security policy makers use the term. Environmentalists use the term in a traditional manner characterized by the first four common elements listed above. The same perspective is observed when the term is used in the context of domestic concerns. ES as it relates to engagement focuses on the fifth common element.

In practical terms, it can be said that ES involves the interrelationship of the environment, regional and national security, the health of a population and the economy. From an Army operational perspective, ES also involves protecting the soldier from the environment and protecting the environment from the soldier. These diverse factors must be analyzed as they relate to: populations and regions within a country, regional stability, shared environmental issues within a region and transboundary environmental and security threats to the U.S.

Peter Gleick identifies four environmental security or resource threats:

- Access to or control of resources as strategic goals
- Attacks on manmade or natural resources
- Resources as military tools
- Disruption to environmental services¹²

Richard Ullman describes an environmental threat to national security as

an action or sequence of events that: 1) threatens drastically and over a relatively brief span of time to degrade the quality of life for the inhabitants of a state, or 2) threatens significantly to narrow the range of policy choices available to the government of a state or to private, non-governmental entities (persons, groups, corporations) within a state.¹³

A working definition of ES for this paper is the analysis of and policy actions taken with regard to man-made or natural environmental issues involving resources whose scarcity, degradation, usage, or perceived unequal allocations may, directly or indirectly, cause friction, instability or conflict globally or within a nation or region. These issues may pose a direct threat to the U.S. or to strategic U.S. security objectives.

3.2 Environmental Issues, Conflict, and Security

It is time to understand “the environment” for what it is: the national security issue of the early twenty-first century. The political and strategic impact of surging populations, spreading disease, deforestation and soil erosion, water depletion, air pollution, and, possibly, rising sea levels in critical overcrowded regions like the Nile Delta and Bangladesh—developments that will prompt mass migrations and, in turn, incite group conflicts—will be the core foreign policy challenge from which most others will ultimately emanate, arousing the public and uniting interests left over from the Cold War.

Robert D. Kaplan¹⁴

It is important to note that not all environmental issues are ES issues. Many environmental issues will not affect the stability of nation states or regions. Further, there are a number of environmental issues around the world that do not have any relation to U.S. security in terms of regional security or international environmental effects.

Most sources agree that there have been no conflicts solely attributable to an environmental issue. These same sources also agree, however, that environmental issues may exacerbate other social and political stressors that will lead to conflict. These issues are environmental security issues. In 1999 the U.N. Environmental Program published a report that lists and describes in detail a number of intranational and international conflicts attributable to environmental issues. A significant number of these conflicts had to do with water and occurred in the CENTCOM AOR. The nations involved included Israel, Jordan, Syria, Iraq, Turkey, Egypt, Ethiopia, Chad and Sudan.¹⁵ An important consideration is the fact that, “since political borders in the Middle East are artificial and divide various ethnic and religious groups, all Middle East rivers and most major aquifers are international and shared by multiple states.”¹⁶

Environmental issues often exist because of economic prioritization: short-term gains exchanged for long-term sustainable growth. Examples include the use of cheap fossil fuels versus newer (and

more expensive) solar technology; increased pollution to save the cost of more expensive pollution prevention technologies; and the use of traditional irrigation methods that consume more water but cost less than newer methods. Environmental issues can affect the security of a nation by causing a significant degradation of the quality of life of its people, usually in terms of health or the economy, thus leading to internal or regional instability.

Unlike war, traditional natural disasters or man-made disasters, most environmental issues evolve very slowly. It is difficult to determine when a critical environmental change is occurring or when a change in some aspect of the environment will have a significant and destabilizing effect on a nation or a region.

Dr. Brian Shaw offers helpful guidelines that can be used in deliberations about environmental issues and security:

First it is important to recognize that both security and environmental issues are contextual; the extent and impact of a given problem is relative to its location and the sensitivity of the system affected. Second, it is the security issue that provides the context for understanding the impacts of environmental issues; third, the analysis of environmental issues must be compatible with the analyses of related security issues.¹⁷

Many military personnel often have a negative or distorted view of environmental issues and activities based on inaccurate information and minimal experience relating primarily to training restrictions and base operations. In light of the larger picture presented here, however, it is clear that environmental issues need to be viewed as resource issues, challenges and opportunities for constructive engagement.

4. ENGAGEMENT

It should be stressed that the broad range of capabilities within the military permit the national leadership to use the military—in which it has invested so much—for more than the traditional combat role.

Admiral Paul D. Miller¹⁸

Engagement can be described in many different ways, but peacetime engagement involves:

- A strategic concept that guides coordinated application of political, economic, informational and military means to enhance stability and promote democratic ideals
- A coordinated Department of State and Department of Defense operation controlled by the country team
- Predominantly non-hostile activity characterized by the benign (non-lethal) use of military forces to stabilize potential crises¹⁹

Such engagement may take many forms. Examples include conferences in the continental U.S. or in the AOR, attendance at various training courses, visitation and observation of DOD or non-DOD agencies, military to military training, large-scale multinational exercises and the development of relatively permanent changes in local attitudes and capabilities.

ES-focused engagement activities are beneficial to the U.S., the host nation(s) and the AOR for a number of reasons. Some of these are listed in the sections that follow.

4.1 Benefits to U.S.

ES-focused engagement activities

- may prevent environmental issues from becoming threats to the U.S.
- help foster professional relationships with senior military and civilian leaders
- allow the U.S. to perform engagement activities in a non-threatening or non-aggressive manner
- may allow for bilateral or multilateral engagement where traditional military training is inappropriate
- enhance the image of the U.S. and U.S. military among the populace, senior military and civilian leadership of the partner nation/region

4.2 Benefits to Host Nation

Non-military assistance will be perceived as less of a threat both to the sovereignty of the nation and to the military balance in the region.

As a result of ES-focused engagement activities,

- assistance on environmental issues will enhance the economy and quality of life in the host nation
- resource quantity and utilization will be improved, thus possibly minimizing internal friction
- the host nation will receive U.S. training in many different disciplines

- a more positive perception of the military and government within and outside the nation's borders can be fostered
- coordinated actions will allow for greater assistance from other governmental and international organizations

4.3 Benefits to Region

ES-focused engagement activities will

- facilitate multilateral conferences and negotiations on regional issues
- provide a forum for synchronization of assets for regional concerns
- promote greater integration and distribution of assistance from other governments and multinational organizations

5. THE CENTCOM AOR: TEP AND ES ISSUES

The CENTCOM AOR encompasses a vast area that is extremely diverse in terms of culture, geography and relationships of nations to the U.S. The AOR covers an area approximately 3,100 miles east to west and 3,600 miles north to south, with 428 million people representing 17 ethnic groups in 25 different countries.

The CENTCOM AOR's four sub-regions are divided as follows:

SUB-REGION	NATIONS
Arabian Peninsula and Iraq	Bahrain, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Yemen
Northern Red Sea	Egypt and Jordan
Horn of Africa	Djibouti, Eritrea, Ethiopia, Kenya, Seychelles, Somalia, Sudan
South and Central Asia	Afghanistan, Iran, Kazakstan, Kyrgystan, Pakistan, Tajikistan, Turkmenistan, Uzbekistan

TABLE 1 CENTCOM AOR

The CENTCOM TEP's objectives are consistent with those of the NSS and the NMS. The Commander in Chief's (CINC's) vision refers to "...expanding engagement activities, and integrating our efforts with other supporting organizations."²⁰

Engagement is one of CENTCOM's three key areas (the other two are warfighting and development). Engagement goals include "develop[ing] integrated regional approaches through cooperation with counterparts in the interagency, other unified commands and

key non-governmental and private volunteer organizations.” One of the development goals is to “promote and support environmental and humanitarian efforts and provide prompt response to humanitarian and environmental crises.”²¹

While some environmental issues are specific to sub-regions or nations, many are common throughout the AOR. Common ES issues may have varying degrees of magnitude, relative criticality and challenge, depending on the sub-region or nation. Climate change is obviously a significant concern. Other common environmental issues in this AOR and perhaps throughout the world are increasing populations, a limited water supply, disease, and industrial pollution. A thorough analysis of all the ES issues in the CENTCOM AOR is beyond the scope of this paper. Some examples of ES issues are discussed below.

5.1 Population

It may be a simplistic generalization, but the ever-increasing human population can be considered the major source of all other environmental problems and a locus of environmental security challenges and opportunities. A growing population results in increasing demands for water, food, and consumer products. It also directly or indirectly increases all forms of waste generation and energy requirements.

Over the last two centuries, the earth’s population has increased dramatically: 1 billion in 1804, 2 billion in 1927, 3 billion in 1960, 4 billion in 1974, 5 billion in 1987 and 6 billion in 1999.²²

Besides having experienced rapid population growth, this AOR exhibits increasing urbanization, large-scale population movements and differential population growth patterns, with less affluent nations and population groups demonstrating the most significant population increases. Overall, the population in the Middle East is expected to double in the next 25 years.²³

5.2 Water

The next war in the Middle East will be over water, not politics.

Boutros-Boutros Ghali²⁴

Increasing water usage for industry, agriculture and personal consumption puts greater demands on an already severely strained water supply system. Water consumption in the Middle East is generally 73% for irrigation, 21% for industrial use and 6% for individual use. Per capita water usage has increased 50% since 1950.²⁵

Most authorities agree that water is the most crucial resource in the Middle East and that issues related to water involve the greatest potential for conflict. "Water scarcity poses a clear threat to internal or domestic security by contributing to health problems, civil strife, economic crises and institutional failures."²⁶

In fact, the continued distribution of water from limited river systems and aquifers is crucial for the survival of Middle Eastern states. The Nile, the Tigris-Euphrates and the Jordan River systems are potential flash points directly related to water access. Interruptions in the distribution of water or lack of access to it could have extensive repercussions affecting the national security not only of many nations in the region but also of the U.S.

Examples of current issues of concern include the following. Turkey has the potential to significantly decrease the downstream water supply to Iraq and Iran for almost a year. The Jordan River is essentially the sole source of surface fresh water in Jordan and Israel, yet Jordan already consumes more water than the Jordan River can supply.²⁷

Another example is that of the Mountain Yaqon-Tamnim aquifer located in the West Bank area of Israel/Palestine. This aquifer provides one-half of Israel's annual supply of ground water and one quarter of its renewable fresh water. Continued overuse of the aquifer is causing an increased seepage of salt water into the water sup-

ply, thus rendering this essential aquifer increasingly useless for drinking and irrigation.²⁸

The Nile is the lifeblood of Egypt. It is estimated, however, that in 20 years Egypt's water requirements will exceed its allotted share of the Nile by 60%. Further complicating the situation is the fact that the flow of the Nile can be controlled by upstream African nations. This poses a significant ES issue for Egypt.²⁹ As Boutros B. Ghali has stated, "The national security of Egypt is in the hands of eight other African countries in the Nile basin."³⁰

5.3 Disease

In spite of significant medical advances, infectious disease is still the leading cause of death throughout most of the world and continues to be a major environmental issue. The health of a population is actually a non-specific but sensitive indicator of a variety of other environmental issues.³¹ Predisposing conditions for infectious disease include urbanization, overcrowding, migration, and a shortage of basic public health requirements. There are other environmentally related disease issues. These include climate change, which affects disease vectors, potentially increasing the area of endemic disease; and the rise in antibiotic-resistant organisms due to the use of antibiotics in animal feed and questionable quality and usage practices in prescriptions.³²

5.4 Hazardous Waste and Industrial Pollution

Hazardous waste and industrial pollution are critical environmental issues in the CENTCOM AOR. In the past, these issues have been largely ignored for a variety of reasons, including long-standing culture and custom, economic factors and historically low population

density. Concerns about waste management and the significant and growing problems relating to pollution are issues of only recent interest.

During Operation Desert Storm, Iraq ignited 732 Kuwaiti oil wells, thus releasing half a million tons of aerial pollutants into the atmosphere. This placed soldiers and local populations at risk for significant acute and chronic health problems. Iraq also released millions of gallons of crude oil into the Persian Gulf as a “weapon” of war. In addition to causing severe environmental damage, this action demonstrated the critical vulnerability of the water desalinization plants that draw their water from the Persian Gulf.³³

Many of the former republics of the Soviet Union are faced with environmental security challenges related to the pollution of ground and surface water from industrial and military pollution. Throughout the AOR, household and industrial wastes pollute most surface water. Rivers are used as sewers.

6. ES ENGAGEMENT PLAN DEVELOPMENT

Although no one wants environmental degradation and scarcity, both are significant in the AOR and both can lead to confrontation and conflict. In the past, particularly in some regions, military institutions have played a very significant role in increasing these problems. Militaries can help by limiting the environmental damage they do; more dramatically, they play a key role in responses to environmental disaster. Environmental cooperation can build democracy, trust, understanding, and may avoid costly military interventions

EUCOM TEP³⁴

Previous sections of this paper have dealt with U.S. national strategy, the concepts of environmental security and engagement, and ES issues in the CENTCOM AOR. This section will discuss methods that can be used to integrate environmental security issues into a TEP to enhance regional security and support national security objectives.

6.1 Objectives and Resources

The objectives of ES engagement activities must be to achieve U.S. strategic objectives by minimizing tensions and conflict relating to or resulting from environmental issues; to promote prosperity and stability in the region; and to enhance U.S. security by mitigating or preventing transboundary threats.

ES engagement resources must be allocated in a manner that will attain the maximum benefits for U.S. security objectives. An analogy can be drawn to medical triage: allocating scarce resources to achieve the maximum benefits. There are many environmental issues that are not and will not become ES issues (examples could include a solid waste dump in the Empty Quarter of Saudi Arabia, an energy plant in central Asia that produces combustion pollutants in

excess of U.S. standards, or poor water quality in a village in the Horn of Africa); resources should not be used on these issues. There are also some ES issues that will require vast resources and result in only limited improvement gains for U.S. security objectives; resources should not be used on these issues either.³⁵ Examples of ES issues appropriate for allocation of engagement resources might include the disparity of water quality and quantity between Israel, Jordan and the Palestinians, pollution of the Persian Gulf by oil refineries, and overpopulation and population migration in the Horn of Africa.

A wide variety of skills and techniques are required for the successful conduct of ES engagement activities. Most of these skills and techniques can be found within the DOD among active duty, Reserve, National Guard or civilian personnel in various agencies and positions throughout the DOD structure. The challenge is to identify the individuals or units that are qualified, trained and ready to accomplish ES engagement missions. This will require careful analysis. For example, it is important to recognize not only the formal military skills resident in the National Guard and Reserve but also the potentially significant skills and experience individuals bring from their civilian occupations. Because the operations tempo of the DOD is high and personnel are stretched thin, it is imperative to balance the use of DOD resources for ES engagement activities with use of these resources in other engagement activities, as well as in contingency operations and humanitarian assistance missions.

Great synergy can be achieved by optimizing a mixture of DOD assets and assets from other U.S. departments and agencies. These other sources could provide individuals trained in the many disciplines that interact in the environmental security arena and resources for the engagement mission. Many of these departments and agencies practice environmentally related skills on a daily basis as part of their performance of engagement-type missions in support of U.S. strategic objectives.

For example, within the Department of State (DOS) the U.S. Agency for International Development (USAID) performs a number of engagement missions throughout the AOR and the world. These

focus on numerous environmentally related issues including agriculture, potable water, public health, technology and economic development. USAID provides financial and logistical support to a diverse variety of international and partner nations' Non-Governmental Organizations (NGOs) and Private Volunteer Organizations (PVOs).³⁶

A lesser-known example involves the activities of the National Center for Environmental Health, part of the Center for Disease Control and Prevention. The National Center for Environmental Health collaborates with UN agencies, governmental and non-governmental organizations, academic institutions and other U.S. agencies on environmental health in this AOR and throughout the world. It is currently engaged in projects focusing on childhood lead poisoning, water sanitation and hygiene, urban health and mega-city development, micronutrient malnutrition and emergency preparedness and response. As part of its efforts, it identifies and assesses current situations and develops training and action programs to combat environmental health challenges.³⁷

Additionally, depending on the specific objectives, there are U.S. and internationally based NGOs and PVOs that can assist, augment and facilitate specific engagement missions. Many of these organizations would be receptive to conducting "joint" activities with the military, as the military can offer technical and logistical support that is often beyond the capabilities of these organizations.

An annual conference to facilitate the integration of non-DOD assets into ES engagement projects should be sponsored by the CINC. The DOS could be the co-sponsor of such a conference. The conference agenda should include a review of regional security objectives, an intelligence update focused on critical ES issues, and briefings on ES-related activities by various agencies and organizations. NGOs/PVOs could also be invited to brief their pertinent regional activities as part of the conference.

6.2 Preparation and Mission Focus

Adequate preparation and mission focus are as essential for ES engagement activities as they are for other critical “high-payoff” military missions. An ES engagement mission that is poorly planned and executed or improperly “targeted” will waste significant resources and may have long-term detrimental effects on future engagement activities in the nation or region.

A thorough intelligence preparation and analysis must be performed to determine what environmental issues are present in each of the four sub-regions. The intelligence preparation must include environmental and economic data as well as traditional types of information regarding the military and socio-political situation in the partner nation(s) and region. The analysis should determine which environmental issues are likely to develop into ES challenges that will affect regional and national security objectives. The analysis should also form the basis for determining what ES engagement activities may mitigate or prevent negative consequences. The data on which the analysis is based can and should come from a variety of military and civilian, open and classified sources.

Classified sources of information include the Director of Central Intelligence Environmental Center, the National Imagery and Mapping Agency, the National Reconnaissance Office, and the Armed Forces Medical Intelligence Center. DOS (embassies, USAID) resources have varying levels of classification, as do those of other federal agencies such as the Department of Energy, the Department of Agriculture and the Environmental Protection Agency. The DOS has recently established Environmental Hubs. In this AOR they are presently located in Addis Ababa, Ethiopia; Amman, Jordan; and Tashkent, Uzbekistan. The mission of these hubs is to provide information about environmental issues and concerns, facilitate U.S. assistance, address and coordinate transboundary issues and enhance regional cooperation.³⁸

Unclassified resources are too numerous to list and are easily accessible through the Internet. Examples of such resources include a variety of United Nations programs and data bases as well as mate-

rial compiled by academic and privately funded environmentally oriented research centers. In all cases, the accuracy of this open source data must be validated.

Once they have been identified, ES issues (whether actual or potential) must be assessed in light of the CINC's intent as well as that of the U.S. ambassador to the partner nation. The development of the ES engagement plan must look at ES issues in terms of criticality, magnitude and effects on the nation/region and their relationship to U.S. security interests.

It is imperative that partner nation(s) contribute to the planning process in terms of their concerns, goals and priorities. This concept of partnership cannot be overemphasized. ES engagement missions, like all engagement missions, require that the partner nations and the U.S. have a mutual understanding of goals and objectives. Arriving at mutual understanding can be more complicated with regard to ES activities than to traditional military training events.

The ES priority analysis and planning process could be used as part of the ES engagement process. At an ES seminar for international officers at the U.S. Army War College held in October 1999, officers from the CENTCOM AOR identified the following critical ES issues:

- Water Resource Management
- Deforestation
- Oil Spills
- Industrial (Refinery) Pollution
- Soil Degradation/Desertification
- Protection of the Marine Environment/Fisheries
- Waste Disposal, including Disposal of Hazardous Materials

- Proliferation of Weapons of Mass Destruction
- Overpopulation
- Urbanization

Clear identification of the impediments or threats to successful ES engagement is the first step toward mitigating these threats. At the ES seminar, officers from the AOR identified the following as among the factors that could impede effective ES engagement:

- the fact that environmental security is a new concept
- significant variability in terms of economy, technology, and type of government among the nations within the AOR
- the fact that in most countries the military is not a significant participant in or is not viewed as a significant contributor to environmental solutions
- skepticism and mistrust of U.S. presence and objectives
- relationship between military and civilian leadership and agencies
- potential preference for civilian versus military assistance
- differing degrees of national commitment to environmental issues

Communication and education are the keys to surmounting these impediments and ensuring that they do not become obstacles to ES engagement activities. Communication with senior military and civilian leaders must occur early and throughout the engagement process. Education must take place at various levels and must stress the importance of environmental and ES issues and their relationship to the long-term success, quality of life and stability of the partner nation.

6.3 ES Engagement Activities

Table 2 lists a number of specific potential ES engagement activities. The initial strategy for initiating ES engagement activities must be focused on heightening environmental awareness and demonstrating the long-term benefits and relevance of environmental involvement to senior military and civilian leaders in the AOR.

ES ENGAGEMENT ACTIVITIES ³⁹
Educate civilian and military leaders. • Conduct focused environmental awareness training in their country. • Invite them to military and civilian training conducted in the U.S. • Invite them to visit U.S. installations to see how the DOD integrates environmental issues. • Invite them to see non-DOD agencies at work. • Conduct regionally focused seminars on various environmental issues. • Integrate environmental responsibility in bilateral and multilateral exercises. • Host regional negotiations on environmental issues. • Integrate environmental training in host nations’ military and civilian development courses.
Coordinate and synchronize regional environmental security activities. • Coordinate a regional conference to identify and discuss regional ES issues. • Assure U.S. coordination and synchronization for U.S. governmental agencies. • Coordinate conferences and seminars on a regional and host nation basis. • Coordinate NGO/PVO conferences, seminars and planning assistance.
Provide subject matter experts to the nation or region in support of ES issues in concert with U.S. objectives.

ES ENGAGEMENT ACTIVITIES, *Continued*

Coordinate, synchronize and assist in the planning of internal, environmentally focused conferences and seminars for civilian, military and community leaders.

Provide coordination for and training in the application of international environmental agreements and standards.

Encourage inclusion of military and civilian leaders at environmentally focused training and education.

Assist in the development of environmental awareness training for military personnel and the general population.

Identify and perform risk analysis for terrorist, industrial or natural environmental disaster.

Provide assistance to plan and coordinate for initial disaster response to terrorist, industrial or natural environmental disaster.

Provide assistance to plan and coordinate for consequence management of terrorist, industrial or natural environmental disaster.

Train host nation security forces in force protection.

Provide, coordinate and assist in the development of an information management/network on environmental information, facts meetings, etc., dealing with such issues as:

- Fish, reef and water protection measures
- Land, water and air assessment techniques and analysis for hazardous materials
- Riverine and inland waterway management, security, development and analysis

Provide training coordination and assistance about ecosystems and biodiversity knowledge.

Train, coordinate and assist in the development of improved agriculture practices and crop selection.

ES ENGAGEMENT ACTIVITIES, *Continued*

Provide technical assistance and training in improved water usage for industrial and agricultural uses.

Train, coordinate and assist in the development of improved forestry management and harvesting.

Plan training activities for junior and mid-level soldiers and leaders.

- Train host nation military and civilian medical systems in detection, analysis and treatment of a variety of environmental threats.
- Train host nation military and civilian personnel to conduct baseline epidemiological studies to detect and analyze adverse environmental effects.
- Train military and civilian security forces in the protection of conservation areas and natural resources and prevention of environmentally focused terrorist threats.
- Provide training, coordination and assistance in land use planning and civil engineering projects.
- Train military and civilian forces in border and coastal security.
- Provide training, coordination and assistance in the design and development of sustainable ranges and training areas.
- Provide training, coordination and assistance in de-mining and unexploded ordnance detection and disposal.
- Provide training, coordination and assistance in pollution prevention.
- Provide training, coordination and assistance in the remediation of land contaminated by military or industrial activities.
- Train, coordinate and assist in the collection, purification and delivery of water.
- Train, coordinate and assist in the collection, removal and management of industrial waste and sewage.
- Train military and civilian agencies in maritime management operations to include port security, inspection of ships and cargo (for hazardous material), reef and fish management.

TABLE 2 ES ENGAGEMENT ACTIVITIES

7. CONCLUSION

This paper has discussed the relevance and importance of ES issues for U.S. security and regional strategic objectives. Peacetime engagement is the method of achieving regional objectives for all situations short of war. ES activities are a valuable focus for peacetime engagement activities because of the many direct benefits to the region and indirect contributions to U.S. security. Unlike traditional military engagement activities, ES engagement activities are non-threatening. They are also beneficial because of their long-term, cost-effective nature. It is always difficult to quantify the cost effectiveness of preventive activities, especially in relationship to the environment. Clearly, however, the contrasting cost of consequence management, in any scenario, is extremely high.

The DOD has the requisite personnel skills and logistic capabilities to perform ES engagement activities unilaterally, or—more appropriately—in concert with other government agencies, NGOs and PVOs. Environmental issues that may become ES issues must be identified and prioritized with regard to their effect on U.S. security objectives. A detailed mission analysis must be performed to determine the resources that will be allocated for the ES engagement mission and the appropriate objective or “endpoint.”

This paper has provided a general overview of and a suggested methodology for developing an ES engagement strategy. The following are specific recommendations to enhance the ES engagement process in the CENTCOM AOR:

- Interagency and international cooperation is critical to the success of the engagement plan. Processes should be developed between the DOS and the DOD to facilitate synchronization if not integration of ES activities. Initial and follow-on annual interagency meetings are essential.
- Engagement activities to heighten general environmental awareness must be conducted for the senior military and civilian leaders throughout the CENTCOM AOR.

CENTCOM ES concerns include: water quality, usage and distribution; public health issues; hazardous waste and industrial pollution; and agriculture and land management. Another significant concern is the potential use of weapons of mass destruction (WMD), byproducts and pollution caused by the development of WMD and environmental issues related to a wide range of military activities.

- Specific foci for each of the four CENTCOM sub-regions are:
 - Horn of Africa—Deforestation, Desertification, Public Health, Water Resource Management
 - Northern Red Sea—Industrial Pollution, Water Resource Management, Urban Development
 - Arabian Peninsula—Hazardous Waste Disposal, Weapons of Mass Destruction, Water Resources, Pollution
 - South and Central Asia—Baseline Environmental Studies and Assessment, Environmentally Balanced Economic Development

CENTCOM and the other unified commands are making great strides toward incorporating the diverse concepts and challenges of environmental security into their theater threat analyses, strategies and engagement plans. ES, while a new concept, provides outstanding opportunities for the U.S and a significant focus for engagement activities over the next 20 years. ES engagement is in fact a valuable long-term investment that will yield benefits, not only in terms of regional stability, but also in terms of promoting economic prosperity, enhancing quality of life and achieving U.S. strategic security objectives.

NOTES

¹ William J. Clinton, *A National Security Strategy for a New Century* (Washington, D.C.: The White House, October 1998), 13.

² Ibid., 1-2, 5.

³ Ibid., 52-53.

⁴ "U.S. National Military Strategy," linked from *Joint Electronic Library*, available from Internet <<http://www.dtic.mil/jcs/nms/>>; accessed 9 September 1999.

⁵ Peter H. Gleick, "Water and Conflict: Fresh Water Resources and International Security," *International Security* 18:1 (1993); quoted in Brian R. Shaw, "When Are Environmental Issues Security Issues?" *Environmental Change and Security Project* 2 (Spring 1996): 39-44.

⁶ Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1962).

⁷ Richard A. Matthew, "Environmental Security: Demystifying the Concept, Clarifying the Stakes," *Environmental Change and Security Project* 1 (Spring 1995): 14.

⁸ Thomas Homer-Dixon, "On the Threshold: Environmental Changes as Causes of Acute Conflict," *International Security* 16, no. 2 (Fall 1991): 77.

⁹ Department of Defense, *Environmental Security*, DOD Directive 4715.1. (Washington, D.C.: U.S. Department of Defense, 24 February 1996), 2-1.

¹⁰ Congress, Senate, Armed Forces Committee, Subcommittee on Readiness and Management Support, *Environmental Security in the Next Millennium*, 13 April 1999, 1.

¹¹ Molly Landholm, ed., *Defining Environmental Security: Implications for the U.S. Army* (Army Environmental Institute, AEPI-IFP-1298, December 1998), iv.

¹² Peter H. Gleick, "Environment and Security: The Clear Connection," *Bulletin of Atomic Scientists* (April 1991), 19; quoted in James A. Winnefeld and Mary E. Morris, *Where Environmental Concerns and Security Strategies Meet: Green Conflict in Asia and the Middle East* (Santa Monica, Calif.: Rand, 1994), 4.

¹³ Richard H. Ullman, "Redefining Security," *International Security* 8:1 (1983): 129-153; quoted in Shaw, 39-44.

¹⁴ Robert D. Kaplan, "The Coming Anarchy," *The Atlantic Monthly* 273, no. 2 (1994): 44-76.

¹⁵ Daniel Schwartz and Ashbindu Singh, *Environmental Conditions, Resources, and Conflict: An Introductory Overview and Data Collection* (Nairobi, Kenya: United Nations Environment Program, 1999), 12-15.

¹⁶ Kent H. Butts, "The Strategic Importance of Water," *Parameters* 17, no. 1 (Spring 1997): 73.

¹⁷ Brian R. Shaw, "When Are Environmental Issues Security Issues?" *Environmental Change and Security Project* 2 (Spring 1996): 40.

¹⁸ Paul D. Miller, "The Inter-Agency Process: Engaging America's Full National Security Capability" (draft copy), January 1993, 4; quoted in Kent H. Butts, *Environmental Security: A DOD Partnership for Peace* (Strategic Studies Institute, USAWC, 25 April 1994), 1.

¹⁹ Brian J. Ohlinger, *Peacetime Engagement: A Search for Relevance* (Strategic Studies Institute, USAWC, 15 October 1992), 2-3.

²⁰ U.S. Central Command, *Shaping the Central Region for the 21st Century* (MacDill AFB, Fla., 1999), 14.

²¹ *Ibid.*, 16.

²² Steve Sternberg, "Earth Welcomes 6 Billionth Baby with Trepidation," *USA Today*, 11 October 1999, sec. D, p. 5.

²³ Butts, 73.

²⁴ *Ibid.*, 65.

²⁵ Sophie Chou, Ross Bezark and Anne Wilson, "Water Scarcity in River Basins as a Security Problem," *Environmental Change and Security Project 3* (Spring 1997): 97.

²⁶ Ibid., 98.

²⁷ Miriam R. Lowi, "Political and Institutional Responses to Trans-boundary Water Disputes in the Middle East," *Environmental Change and Security Project 2* (Spring 1996): 6.

²⁸ Ibid., 5-8.

²⁹ Kent H. Butts, *Environmental Security: A DOD Partnership for Peace* (Strategic Studies Institute, USAWC, 25 April 1994), 14-15.

³⁰ Sandra Postel, "Dividing the Waters: Food Security, Ecosystem Health, and the New Politics of Scarcity," *Worldwatch Paper 132* (September 1996): 73; quoted in Chou, 101.

³¹ Rohit Burman, Kelly Kirschner and Elissa McCarter, "Infectious Disease as a Global Security Threat," *Environmental Change and Security Project 3* (Spring 1997): 66-81.

³² Dennis Pirages, "Microsecurity: Disease Organisms and Human Well-Being," *Environmental Change and Security Project 2* (Spring 1996): 9-14.

³³ James A. Winnefeld and Mary E. Morriss, *Where Environmental Concerns and Security Strategies Meet: Green Conflict in Asia and the Middle East* (Santa Monica, Calif.: Rand, 1994), 27, 41.

³⁴ U.S. European Command, *Strategy of Readiness and Engagement* (Stuttgart, Germany, April 1998), 10.

³⁵ Shaw, 39-44.

³⁶ "Asia/Near East, Greater Horn of Africa Initiative, Central/Eastern Europe," linked from *U.S. Agency for International Development*, available from Internet <<http://www.info.usaid.gov/regions>>; accessed 20 September 1999.

³⁷ William Parra, Deputy Director, National Center for Environmental Health, Center for Disease Control and Prevention, interviewed by author, 7 October 1999, Atlanta, Ga.

³⁸ The ideas in this paragraph are based on remarks made by speakers at the International Fellows Environmental Security Seminar, U.S. Army War College, 20-21 October 1999 and the Environmental Security Intelligence and Information Workshop, U.S. Central Command, 18-20 January 2000.

³⁹ The activities presented in this table were developed at a CENTCOM ES Annex working group meeting attended by Dr. Kent Butts, LTC Don Young, LCDR Paul Beckwith and myself, September 1999.

BIBLIOGRAPHY

- “Asia/Near East, Greater Horn of Africa Initiative, Central/Eastern Europe.”
Linked from U.S. Agency for International Development. Available
from Internet <<http://www.info.usaid.gov/regions/>>. Accessed 20
September 1999.
- Burman, Rohit, Kelly Kirschner and Elissa McCarter. “Infectious Disease
as a Global Security Threat.” *Environmental Change and Security
Project 3* (Spring 1997): 66-81.
- Butts, Kent H. *Environmental Security: A DOD Partnership for Peace*.
Strategic Studies Institute, USAWC, 25 April 1994.
- _____. “The Strategic Importance of Water.” *Parameters* 17, no. 1
(Spring 1997): 65-83.
- Carson, Rachel. *Silent Spring*. Boston: Houghton Mifflin, 1962.
- Chou, Sophie, Ross Bezark and Anne Wilson. “Water Scarcity in River Ba-
sins as a Security Problem.” *Environmental Change and Security
Project 3* (Spring 1997): 96-104.
- Clinton, William J. *A National Security Strategy for a New Century*.
Washington, D.C.: The White House, October 1988.
- Gleick, Peter H. “Environment and Security: The Clear Connection.” *Bul-
letin of Atomic Scientists* (April 1991), 19. Quoted in James A. Win-
nefeld and Mary E. Morriss, *Where Environmental Concerns and
Security Strategies Meet: Green Conflict in Asia and the Middle
East*, Santa Monica, Calif.: Rand, 1994.
- _____. “Water and Conflict: Fresh Water Resources and International
Security.” *International Security* 18:1 (1993). Quoted in Brian R.
Shaw, “When Are Environmental Issues Security Issues?” *Environ-
mental Change and Security Project 2* (Spring 1996): 39-44.

- Homer-Dixon, Thomas. "On the Threshold: Environmental Changes as Causes of Acute Conflict." *International Security* 16, no. 2 (Fall 1991): 76-116.
- Kaplan, Robert D. "The Coming Anarchy." *The Atlantic Monthly* 273, no. 2 (1994): 44-76.
- Landholm, Molly, ed. *Defining Environmental Security: Implications for the U.S. Army*. Army Environmental Institute, AEPI-IFP-1298, December 1998.
- Lowi, Miriam R. "Political and Institutional Responses to Transboundary Water Disputes in the Middle East." *Environmental Change and Security Project* 2 (Spring 1996): 5-8.
- Matthew, Richard A. "Environmental Security: Demystifying the Concept, Clarifying the Stakes." *Environmental Change and Security Project* 1 (Spring 1995): 14-23.
- Miller, Paul D. "The Inter-Agency Process: Engaging America's Full National Security Capability" (draft copy), January 1993, 4. Quoted in Kent H. Butts, *Environmental Security: A DOD Partnership for Peace*. Strategic Studies Institute, USAWC, 25 April 1994.
- Ohlinger, Brian J. *Peacetime Engagement: A Search for Relevance*. Strategic Studies Institute, USAWC, 15 October 1992.
- Pirages, Dennis. "Microsecurity: Disease Organisms and Human Well-Being." *Environmental Change and Security Project* 2 (Spring 1996): 9-14.
- Postel, Sandra. "Dividing the Waters: Food Security, Ecosystem Health, and the New Politics of Scarcity." *Worldwatch Paper* 132 (September 1996): 73. Quoted in Chou, 101.
- Schwartz, Daniel and Ashbindu Singh. *Environmental Conditions, Resources, and Conflict: An Introductory Overview and Data Collection*. Nairobi, Kenya: United Nations Environment Program, 1999.

Shaw, Brian R. "When Are Environmental Issues Security Issues?" *Environmental Change and Security Project 2* (Spring 1996): 39-44.

Sternberg, Steve. "Earth Welcomes 6 Billionth Baby with Trepidation." *USA Today*, 11 October 1999, sec. D, p. 5.

Ullman, Richard H. "Redefining Security." *International Security* 8:1 (1983): 129-153. Quoted in Shaw, 39-44.

U.S. Central Command. *Shaping the Central Region for the 21st Century*. MacDill AFB, Fla., 1999.

U.S. European Command. *Strategy of Readiness and Engagement*. Stuttgart, Germany, April 1998.

U.S. Congress. Senate. Armed Forces Committee. Subcommittee on Readiness and Management Support. *Environmental Security in the Next Millennium*. 13 April 1999.

U.S. Department of Defense. *Environmental Security*. DOD Directive 4715.1. Washington, D.C.: U.S. Department of Defense, 24 February 1996.

"U.S. National Military Strategy." Linked from *Joint Electronic Library*. Available from Internet <<http://www.dtic.mil/jcs/nms/>>. Accessed 9 September 1999.

Winnefeld, James A. and Mary E. Morris. *Where Environmental Concerns and Security Strategies Meet: Green Conflict in Asia and the Middle East*. Santa Monica, Calif.: Rand, 1994.