U.S. Environmental Security:
Understanding And Enabling It To Matter

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By

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DEDICATION

This work is dedicated to my very patient and loving wife, Adriana. Without you, I would not have completed this project, maintained my health, or kept my sense of humor.

This is also dedicated to my family and friends (near or far), without whom I would not have embarked upon this journey.

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LIST OF ABBREVIATIONS

Abbreviation	Name
AEPI	Army Environmental Policy Institute
CEQ	Council on Environmental Quality
COCOMs	Combatant Commanders
CONUS	Contiguous United States
DHS	Department of Homeland Security
DNI	Director of National Intelligence
DOD	Department of Defense
DODD	Department of Defense Directive
DOE	Department of Energy
DOI	Department of the Interior
DOJ	Department of Justice
DOL	Department of Labor
DOS	Department of State
DOT	Department of Transportation
DSB	Defense Science Board
ECSP	Environmental Change and Security Program
EISA	Energy Independence and Security Act of 2007
ENCOP	Environment and Conflict Project
EPAct 2005	Energy Policy Act of 2005
EPA	Environmental Protection Agency
ESOH	Environment Safety and Occupational Health
FEWS NET	Famine Early Warning System Network
FOB	Foreign Object Debris
FOUO	For Official Use Only
GESST	Global Environmental Security Survey Teams
GECHS	Global Environmental Change and Human Security
GMES	Global Monitoring for Environment and Security
GMU	George Mason University
GWOT	Global War on Terrorism
HAZMAT	Hazardous Material
HHS	Department of Health and Human Services
HSC	Homeland Security Council
HSRB	Human Subjects Review Board
HUD	Department of Housing and Urban Development
JCS	Joint Chiefs of Staff
MOOTW	Military Operations Other Than War

MS	Microsoft®
NATO	North Atlantic Treaty Organization
NIC	National Intelligence Council
NGOs	Non-Governmental Organizations
NPSD	National Security Presidential Directive
NRP	National Response Plan
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act of 1969
NMS	National Military Strategy
NSC	National Security Council
NSHS	National Strategy for Homeland Security
NSS	National Security Strategy
OCONUS	Outside Contiguous United States
OSD	Office of the Secretary of Defense
OSTP	Office of Science and Technology Policy
P2	Pollution Prevention
PRIO	International Peace Research Institute
QDR	Quadrennial Defense Review
S&T	Science and Technology
SSTR	Stability, Security, Transition, and Reconstruction
UCC	Unified Combatant Command
UNDP	United Nations Development Programme
U.S.	United States
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture

ABSTRACT

U.S. ENVIRONMENTAL SECURITY, UNDERSTANDING AND ENABLING IT TO MATTER

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This research project develops new knowledge of how U.S. national security and homeland security practitioners and policymakers understand, define, and could yield value from the concept of environmental security to meet their mission, policy, and operational challenges. The project does so by achieving three primary objectives. First, it captures U.S. national security and homeland security practitioners' and policymakers' understandings and definitions of environmental security. Second, based upon those understandings and definitions, it identifies common attributes that conceptually bridge, operationalize, and could add value to these groups' existing mission, policy, and operational responsibilities. Finally, based upon these analyses, it develops a better understanding of current functional capability needs and resources within U.S. national security and homeland security communities of practice.

CHAPTER 1: INTRODUCTION

Following the end of the Cold War, U.S. national security policy making and analysis communities started to more intensely examine the relationship between security, conflict, and environmental considerations (Dabelko and Simmons 1997). This reevaluation spurred interest within both the national security and academic communities to better define and understand the concepts and implications of "environmental security" (Glenn *et al.* 1998: 10; King 2000; Matthew 1999; Belluck *et al.* 2006). Over the past two decades, the environmental security concept has generated significant discussion and debate despite growing political and practitioner recognition that negative environmental trends can represent underlying "antecedents" to conflict or "mass violence" throughout the world (Foster 2001: 384, 388; Ohlsson 1999). Since the late-1990s, there have been a limited number of survey-based government and international research efforts to gauge policymakers' and practitioners' definitions of environmental security to generate a conceptually sound yet actionable understanding of the concept (Glenn *et al.* 1998; King 2000; Kingham 2006). However, U.S. policymakers and practitioners continue to wrestle with this concept despite its renewed and growing relevance to the domestic and foreign policymaking process and operations (King 2000; Foster 2001; Matthew 2000).

The environmental security concept continues to lack a commonly accepted definition, understanding, and explicit practical utility for U.S. national and homeland

security communities' missions. Pioneers on this topic lament these challenges and argue that the concept still needs a sound and acceptable framing (Dabelko and Matthew 2003). Based upon the literature in this growing field of study, it was apparent that this research effort's ultimate aim should not be to add a new definition of environmental security to the growing number of alternatives (King 2000; King 2008). Previous academic and practitioner efforts identified the need to actionably define environment security in ways that would better enable national and homeland security practitioners to build consistent yet mission relevant definitions (Belluck *et al.* 2006). The ongoing debate on exactly how to accomplish these ends illuminates the need for flexible and interoperable components that define the concept in a more understandable, relevant, and actionable manner, particularly when integrated and implemented at multiple scales (i.e., strategic, operational, and tactical).

While progress to this end continues, U.S. focused and official activities on environmental security seemed to have declined since 9/11 (Taureck and Dabelko 2006). More recent activity is increasing bringing this controversial issue back to the forefront because challenges related to Stability, Security, Transition, and Reconstruction (SSTR), forward basing, energy security, and climate change (Taureck and Dabelko 2006; Beebe 2008a; Pumphrey 2008). Meanwhile, the global war on terrorism (GWOT), Operation Enduring Freedom, Operation Iraqi Freedom, and the aftermaths of the Southeast Asian Tsunami, Hurricane Katrina and Rita have all highlighted the many environment-related security challenges facing the U.S. Government's national and homeland security policy, missions, and operations communities.

Taken together, it seems that there is an acute need for the knowledge necessary to characterize and operationalize environmental security in a functional manner. As such, this Master of Science, Environmental Science and Policy Program, Thesis Research Project seeks to address these potential gaps and contribute to the development of the knowledge necessary for meaningful policymaking and implementation. The project's goal is to gain new knowledge on how U.S. national security and homeland security practitioners define, understand and could yield value from environmental security to meet their mission, policy, and operational challenges.

To this end, the project aims to affirm common elements for environmental security, determine mission relevant environmental security issues, and identify mission and operational capability gaps and available resources. In doing so, it engages interested U.S. national and homeland security professionals to help better understand their perspectives and explore environmental security's potential to help them meet their emerging mission and operational needs. More broadly, this research intends to also serve U.S. national and homeland security communities' needs by providing new understanding and an updated entry-level resource for developing the strategic approaches, resources and tools, which are necessary to better recognize and act upon environmental security risks to U.S. national and homeland security.

This thesis documents the above-mentioned research effort, its outcomes, and analysis. Chapter 2 provides a limited background on relevant past efforts and the current state of environmental security studies. Chapter 3 describes the thesis project, its detailed work plan, and its methodologies. Chapter 4 presents the context for and results

of the project's mission and functional analysis of U.S. Government's Executive Branch national and homeland security institutions. Chapter 5 summarizes and analyzes the results of the research effort's environmental security definition and understanding survey. Chapter 6 presents the focus group workshop and its outcomes, including the identified environment and security issues, needs, and available resources. Chapter 7 discusses the thesis's overarching findings, their implications within the current U.S. policy environment, potential implementation opportunities, and the need for future research efforts. Chapter 8 presents the project's final conclusions.

CHAPTER 2: ENVIRONMENTAL SECURITY'S ACADEMIC AND POLICY BACKGROUND

Asserting linkages between the environment and security spheres is not a new phenomenon and has been a growing subject of debate since the 1950s (Matthew 2000). Starting in the 1970s with the early writings of Lester Brown and following with the subsequent works by William Ophuls, Jessica Tuchman Mathews, and Norman Myers, the stage was set for a spicy academic and policy debate through their broad calls to "redefine security" (Vandeveer and Dabelko 2001: 166; Krause and Williams 1996; Matthew 2000; Dalby 2002a). The end of the Cold War spurred even closer attention to the "redefinition of security" and the resultant conceptualization of environmental security by U.S. national security and international relations researchers and practitioners (Dalby 2002b: 96; Foster 2001; Matthew 2000).

As part of this larger security debate, United Nations Development Programme (UNDP) introduced the "human security" paradigm in its "Human Development Report 1994: New Dimensions of Human Security" report (1994: 24). Based upon sustainable development principles, this new policy paradigm sought to shift the focus of security toward individuals' "freedom from fear" and "freedom from want" (UNDP 1994: 24; Floyd 2007a; Beebe 2008a). With a "preventive" approach and broad applicability, this "people-centric" paradigm laid out seven threat categories, and "environmental security" was identified as one of these key components (UNDP 1994: 22, 23, 25).

This post-Cold War academic debate surrounding environmental security ranged from Chaturvedi's (1996) broad discourse of transitioning geopolitical priorities, to Krause and Williams' (1996) questioning the conceptual redefinition of security, to peace researchers perspectives examining the environment's role as a weapon or potential venue for cooperation (Brock 1991). Despite environmental security's potential for better understanding the roots of conflict, its prevention, or engendering peace in post-conflict situations (e.g., "peace parks"), there were several conceptual concerns raised early on by practitioners about potentially militarizing the environment and push back over the scope of "core security" studies (Brock 1991: 421; Krause and Williams 1996: 234). Others simply found military capabilities to be mismatched to the operational implications and challenges of environmental security (Vandeveer and Dabelko 2001).

Building on Dr. Carsten Rønnfeldt's (1997) earlier "[t]hree generations" work, Dr. Simon Dalby (2002b) concisely describe the environmental security concept's evolution in four "stages" that include: 1) "broader understanding of security," 2) linkage exploration "between environment and insecurity," 3) "empirical verification or refutation" of identified linkages, and 4) "synthesis and reconceptualization" (Dalby 2002b: 96). Early on, the dominant, second stage framing of environmental security suggested that natural resource competition and environmental degradation could "trigger, amplify and cause conflict and instability" at local, national, and/or global scales (Homer-Dixon 1994, 1999; Gleick 1993; Mansfield 2004: 1). Environmental stressors' causality and linkage to nation-state conflict is a contentious issue traced to the back and forth debate spurred early on by Malthus (Ohlsson 1999). This early second stage

environmental security debate was rooted in the work of Homer-Dixon (1994, 1999), Peter Gleick (1993), and others, but such assertions have been bedeviled with evidentiary, methodological, and environmental deterministic criticisms leveled by critics (Vandeveer and Dabelko 2001; Foster 2001).

As this conceptual debate has matured, the environmental security concept has now benefited from several years of focused research, and, as a result, fears of direct "large-scale [nation-state] warfare over renewable resources" have mostly receded (Dalby 2002b: 95). As this concept has developed into its third and fourth stages, Dalby (2002b) identified and summarized the six main "schools" of environmental security thought, which have been summarized in Table 1 below (96).

Table 1: Schools of Environmental Security

"**Toronto School" (Thomas Homer-Dixon):** Environmental change & population growth ⇘ "Resource capture" vs. "ecological marginalization" (i.e., artificial scarcity) ⇘ Insurgency, political violence, & state failure
International Peace Research Institute (PRIO) (Indra de Soysa): "Southern" resource abundance ⇘ Struggle and influence to control resources ⇘ Local / region "core-periphery" conflicts (i.e., weapons & failed states)
Geopolitical "Resource Wars" / "Neo-Malthusian" (Michael Klare): Global petroleum and water scarcity ⇘ Geopolitical stress and competition ⇘ "Southern conflict" over scarce resources
NATO School (Colin Kahl): Environmental factors dynamic in social change ⇘ "Syndromes" or pathways to conflict
Environment and Conflict Project (ENCOP) (Günther Baechler): "Southern" development vs. social change ⇘ "Core-periphery" "maldevelopment" & "environmental discrimination" (i.e., inequitable access to resources) ⇘ Insurgency and resisting modernity

Global Environmental Change and Human Security (GECHS):

Population vulnerabilities vs. changing environments

- ↘ Poverty linked to environmental & social vulnerability
- ↘ Focus on rural poor

(Dalby 2002b: 96-98)

Concurrent to this spirited academic debate, the environmental security concept has been slowly gained more widespread and growing acceptance within policymaking circles. Internationally, bodies such as the United Nations, Organisation for Economic Co-operation and Development, and European Union have been actively pursuing and supporting efforts to better understand the environmental component of conflict dynamics (AC/UNU Millennium Project 1998; Mansfield 2004; OECD-DAC 2005; European Commission 2004). In 2004, the European Commission went as far as to mandate the creation of Global Monitoring for Environment and Security (GMES) system to provide the requisite data collection, integration, and analysis system to "enable decision-makers to better anticipate or mitigate crisis situations and issues relating to the management of the environment and security" (European Commission 2004: 3).

Likewise, the U.S. environmental security academic and policy dialog has generated growing political and practitioner recognition that negative environmental dynamics can represent underlying "antecedents" to conflict or "mass violence" throughout the world (Foster 2001: 384, 388; Ohlsson 1999; Mansfield 2004: 1). Within the U.S. community, it seems like the most relevant conceptual and operational challenge to environmental security's acceptance is the identified need to better define and understand the concept and its mission implications for the U.S. national and homeland

security communities (Glenn *et al.* 1998; Belluck *et al.* 2006). U.S. national security analysts, scientists, and policymakers have hotly debated the definition of environmental security since the end of the Cold War (Glenn *et al.* 1998, King 2000; Vandeveer and Dabelko 2001; Belluck *et al.* 2006). During the 1990s, a limited "real-politik" definition was embraced by the U.S. Department of Defense (DOD) in its adoption of DOD Directive (DODD) 4715.1 that focused on nation-state centered security issues and environmental implications of maintaining standing defense infrastructure and forces (Ohlsson 1999: 27; DOD 1996; Belluck *et al.* 2006). However, U.S. policymakers and practitioners intellectually and politically continue to wrestle with this concept despite its growing relevance to the national and homeland security policymaking process (King 2000; Foster 2001; Matthew 2000).

Since the late-1990s, there have been a limited number of U.S. survey-based government and international research efforts to help gauge policymakers' and practitioners' understandings and definitions of environmental security to generate an actionable paradigm (Glenn *et al.* 1998; Kingham 2006). Both Dabelko (1997) and King (2000, 2008) suggest that the definition problem comes down to the issues of framing environmental security into elements that make it relevant and actionable to national security institutions and practitioners. Krause and Williams likewise suggest that the real value added is the "policy relevant knowledge" that such an approach enables that otherwise would be insoluble under more traditional security purviews (1996: 249). While Dabelko (1997) expresses concerns about the short-sightedness of U.S. security risk or threat assessment frameworks, King (2000) makes a persuasive argument to

define environmental security, however imperfectly, to make the concept a more relevant and useful cornerstone of the U.S. National Security Strategy (NSS) and DOD's mission, policies, and operations. Likewise, King (2000, 2008) explicitly recognized that a shared understanding is still lacking but that an understandable definition and primer would help guide national security policymakers and practitioners to identify where environmental and security issues overlap to become mission relevant and actionable.

Based upon the growing literature in this field, it is clear that the proposed research should not be to add yet another definition of environmental security to the growing number of alternatives but rather to deploy research methods that could validate more actionable elements and components of environment security. The results could then help national and homeland security practitioners to build a consistent yet functional definition unique for their respective institutions (Glenn *et al.* 1998; Belluck *et al.* 2006). Furthermore, the literature illuminates the need for a shared understanding and common definitional components that would make environmental security actionable and mission relevant from U.S. national and homeland security perspectives, particularly by enhancing interagency cooperation and external partnering strategies. To these ends, this thesis focuses on these real world needs to enable the strategic mission support potential and operational opportunities of the environmental security concept.

CHAPTER 3: PROJECT GOAL, OBJECTIVES, AND METHODOLOGY

Given the continuing debate over the meaning and implementation of environmental security, this research project's primary goal is to gain new knowledge of how U.S. national security and homeland security practitioners and policymakers define, understand and could yield value from environmental security implementation to help meet their mission, policy, and operational challenges. The research questions addressed are:

- What is the common understanding of environmental security among U.S. national security and homeland security practitioners and policymakers?
- What are the differences and similarities in understandings of environmental security by these communities of practice?
- What commonalities conceptually bridge and could add value to existing policy analysis, threat assessment, and operational planning frameworks?
- What are the capability needs (or opportunities) that exist among the current stakeholders at the federal level?
- How are these needs expressing themselves in both domestic and international crises?

This thesis research project's specific objectives are to:

1) Capture U.S. national security and homeland security practitioners' and policymakers' current understandings of environmental security;

2) Identify common definitional components and attributes that conceptually bridge, operationalize, and could add value in meeting institutional mission, policy, and operational challenges; and
3) Understand current capability needs and existing resources within U.S. national security and homeland security communities of practice.

Project Research Plan:

To achieve these objectives, the project's research plan is broken down into five separate yet complementary tasks. They are part of an action research approach and are broken out to include:

- ✓ *Task 1: Federal National and Homeland Security Mission and Functional Analysis*
- ✓ *Task 2: Participant and Stakeholder Identification*
- ✓ *Task 3: Definitional Component and Understanding Capture*
- ✓ *Task 4: Commonality Leveraging, Operationalization, and Gap / Opportunity Assessments*
- ✓ *Task 5: Participant and Stakeholder Result Sharing*

Each of these tasks builds upon the previous ones and collectively represents an evolutionary investigative process and plan. It is specifically design to effectively develop the requisite knowledge, understanding, and participant ownership to successfully achieve the previously stated research objectives. These tasks are very complementary and dynamic as illustrated in the project flow diagram shown below in Figure 1.

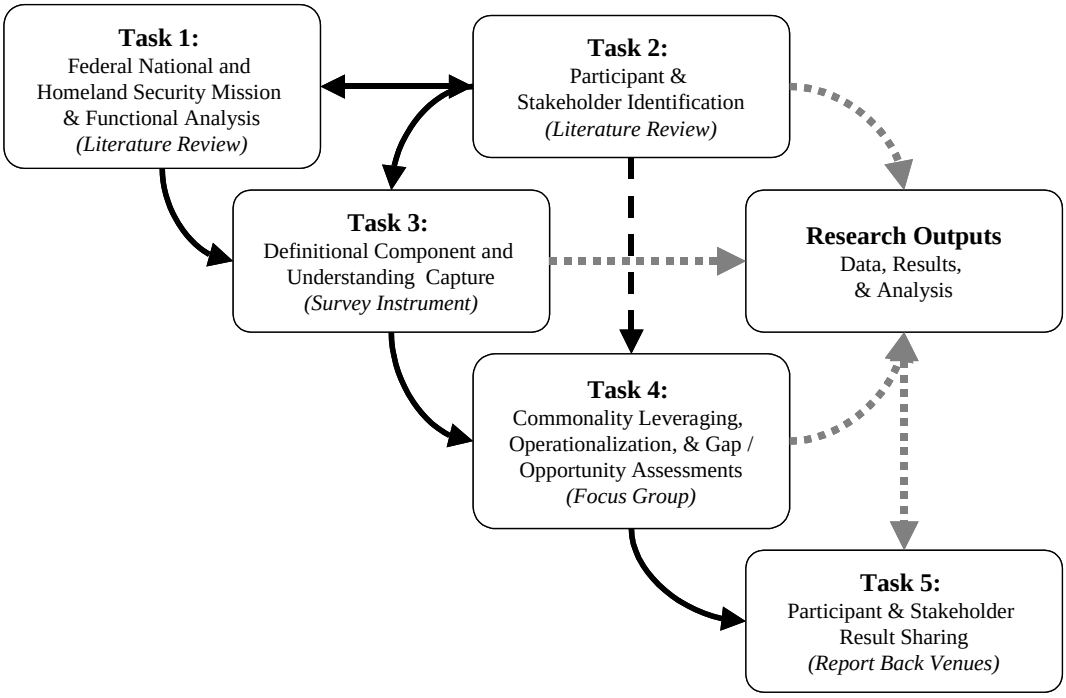

Figure 1: Project Research Process Flow By Task

Project Research Methodology:

The project's approach and investigational methodology drew upon several existing and functionally relevant qualitative research efforts. As discussed earlier in Chapter 2, the literature review yielded two specific qualitative research studies that directly focused on environmental security. The Glenn *et al.* (1998) and Kingham (2006) research efforts provide excellent starting points and their survey-based methodologies provide a good basis to investigate the proposed research questions. However, despite the substantial amount of policy literature on the topic, existing resources still did not seem to address on-going immaturity and diversity of environmental security definitions to effectively operationalize the concept. As such, its strategic potential did not seem

realized to better enable national and homeland security institutions and practitioners meet their policy, mission, and operational challenges.

To this end, the methodology utilized an "action research" approach that drew on three primary investigational tools, including: 1) a **comprehensive literature review**, 2) an **email survey**, and 3) a **focus group workshop** (Berg 2006: 225; King 2000; Dessai *et al.* 2004; Crate 2006). First, a comprehensive literature review identified federal agencies' and departments' national and homeland security missions and functionalities. This review also identified potential participants and compiled their host organization, mission, position, and contact information. Second, an e-mail survey solicited and captured practitioners' definitions of environmental security, its relevance for their institution's mission and operations, and any known environmental security capability gaps and tools needed. Third, a project workshop developed participants' shared understanding of environmental security, identified the concept's institutional relevance and implications, explored capability needs and resources, and generated participant consensus and ownership.

Human Subject Review:

Prior to start of field research, an application and project materials were submitted to the George Mason University (GMU) Human Subjects Review Board (HSRB). After some requested amendments, HSRB approved the project's research methods on March 13th, 2008. Participant consent for Task 3 activities was addressed through the attachment of a GMU HSRB informed consent disclosure to the electronic survey instrument sent via email (Berg 2006). Likewise, participants in the Task 4 focus group

workshop received an informed consent disclosure form to sign prior to the start of the workshop activities. All attributable, confidential project data and results were maintained electronically on a secured computer with physical and access limited to key research staff.

Project Research Methodology by Task:

Task 1: Federal National and Homeland Security Mission and Functional Analysis

The existing research geared toward defining environmental security was found to identify their participants and consultants through a broad array of international and diplomatic sources (Glenn *et al.* 1998; Kingham 2006). Since this research project is focused on U.S. national security, homeland security and environmental communities, it examined the current federal level departments, agencies, and institutions with missions and responsibilities in security and environment areas (Kingham 2006). This comprehensive literature review drew on publicly available literature to identify federal agencies' and departments' national and homeland security missions and functionalities, where available (King 2000). This first provided the initial information and materials necessary to identify relevant participants and stakeholders in Task 2 (Glenn *et al.* 1998; Kingham 2006). Second, it allowed me to identify the relevant U.S. Government Executive Branch institutions, their responsibilities, and their functionalities to assist in the preparation of the electronic survey instrument and focus group workshop to be completed under Task 3 and Task 4, respectively (Crate 2006; Dessai *et al.* 2004). In particular, this comprehensive literature review was key to identifying policymaking

processes, topics, and challenges relevant to these stakeholders' institutional missions and responsibilities. Finally, the early reconnaissance of the relevant institutions and participants was important background to better identifying their mission needs and how the environmental security concept could help address those needs, which were explored in detail during the Task 4's workshop venue (Crate 2006; Berg 2006). Additional details on the Task 1 research process are further elaborated in Chapter 4.

Task 2: Participant and Stakeholder Identification

In Task 2, the project's research effort began with the identification of potential institutional policymaker and practitioner participants for the Task 3 email survey efforts and the subsequent Task 4 focus group workshop. First, I identified the initial participants and stakeholders using the information gathered under Task 1 literature review. Second, to supplement these results, publicly available environment and security conference resources were data mined for relevant individuals and their contact information. Finally, based upon earlier contacts, I also used professional referrals to yield potentially interested individuals. These efforts also leveraged known professional contacts and workgroups from prior cooperative efforts, such as the Army Environmental Policy Institute (AEPI), the Army Installation Sustainability Program, etc. As they were identified, I added target participants and their information to a contact tracking database. Task 2 efforts also included early rapport building and consultant cultivation activities (Berg 2006). These efforts were sustained throughout the duration of the thesis research project.

Task 3: Definitional Component and Understanding Survey

This project's primary field research method was the email survey of national security, homeland security, and environmental professionals identified in the earlier Task 2 effort. I sent these professionals a brief MS Word® survey instrument via email. The survey email included a brief project description and informed consent disclosure addendum and was as concise and brief as possible to increase participation (Kingham 2006). The survey instrument served to: 1) identify participants' individual and/or agency's definition of environmental security, if applicable; 2) assess their agreement with, relevance, and applicability of identified definitional components (e.g., Glenn *et al.* 1998); 3) identify environmental security's use and/or perceived relevance to their professional work; 4) explore participants' thoughts on policy, functional implications and in relation to sustainability issues; 5) better understand their institution's (or others') relevant environmental security capabilities and coordination responsibilities; 6) identify related capability gaps and examples of their impacts, if available; and, 7) determine their interest to participate in the Task 4 workshop (Crate 2006; Berg 2006). I distributed and administered this survey via email in six consecutive mailings from April 2008 through August 2008. Additional details on the Task 3 research process are further elaborated in Chapter 5. Please note, for the purposes of this survey and project, the working definition of sustainability is the "Triple Bottom Line" of "Mission, Environment, and Community" that enables the national and homeland security communities "to simultaneously meet[s] current as well as future mission requirements worldwide, safeguards human health, improves quality of life, and enhances the natural environment" (U.S. Army 2004: 5).

Task 4: Commonality Leveraging, Operationalization, and Gap Assessments Workshop

Task 4 research efforts built on the knowledge and contacts compiled through Tasks 1-3. Leveraging those resources, I organized an interactive focus group workshop at GMU's Fairfax Campus on September 18th, 2008. This workshop engaged many of the U.S. national and homeland security professionals, who had participated in the earlier survey and indicated an interest in participating. This workshop was crafted to approximate encroachment and sustainability planning efforts already used within the federal target audience communities. It was intended to: 1) generate greater familiarity and discussion; 2) validate, disapprove, and/or augment Task 3 email results; and 3) identify strategic or operational capability needs and resources in a consensus oriented environment. The one-day workshop format was utilized since a longer duration would have prevented key target groups from participating (Kingham 2006). This method was also chosen to help develop stakeholder ownership of the results to assist with and serve the action research purposes of this research project.

During the first part of this workshop, I presented the project's process, basic terms, background on environmental security, and initial Task 3 survey results. Following this introduction, the participants were lead in a group brainstorming session identifying connections between environment and security, how these apply to their missions and operations, and discussion of commonalities across relevant federal institutions. These results were recorded on flipcharts and displayed in the workshop room. Next, the participants were randomly divided into working groups, mixed by institution and functionalities. These work groups were tasked to: 1) select existing or

propose new common definitional components of environmental security; 2) identify how those commonalities apply to national and security needs; 3) record these findings on prepared templates; and 4) post these results on a designated wall of the plenary room venue. These consensus-derived environmental security components were organized and predominately displayed in the room. In the next phase, I organized new working groups by similar institutional and/or functional areas. These new focus groups were tasked to: 1) identify the environmental security components that apply to their institution; 2) record responsible points of contacts for each, if known; 3) identify specific environmental-defense issues that fall under each relevant environmental security component; 4) identify and/or backcast the relevant capability needs and available resources that fall under each relevant environmental security component; and 5) record these results on templates provided. After finishing these activities, I thanked the participants for their participation, reminded of the on-going nature of this process, and informed about the intended report back arrangements under Task 5.

Task 5: Participant and Stakeholder Result Sharing

As referenced in Figure 1, I compiled the project's research outputs and data throughout the course of each of the tasks. Task 5 incorporates the report back and collaboration function of this action research oriented process as elaborated in Glenn *et al.* (1998), Berg (2006), and Crate (2006). The approach consisted of a two-step process. First, all the Task 3 & 4 participants were sent a post-workshop (Task 4) draft of the thesis project findings and asked them to provide comment before the final due date of

this thesis (November 17, 2008). Comments received by that date are incorporated as an appendix to the final version of the thesis report. Second, following thesis acceptance and its successful defense, it is to be distributed to all participants and the relevant Executive Branch stakeholder contacts. The project's task completion schedule is elaborated in Figure 2.

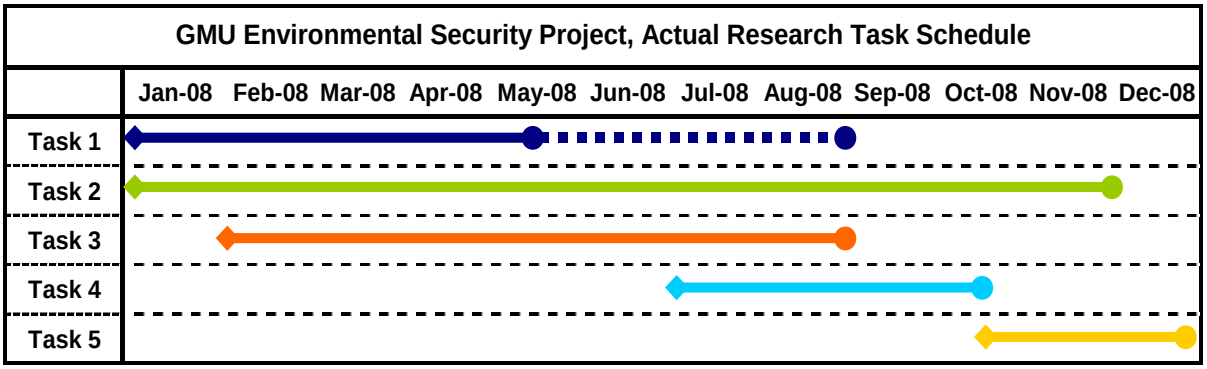

Figure 2: Project Research Task Schedule

Table 2: Data, Results, and Analysis Outputs

Research Outputs			
	Data Collected	**Results**	**Outputs**
Task 1	U.S. federal departments,' agencies,' and institutions' national security, homeland security, and environmental mission statements	1) Identified U.S. national security, homeland security, and environmental missions and functionalities 2) Identified context for interest/needs related to environmental security	1) MS Excel® based spreadsheet hierarchy and list of agencies, departments, and functional areas. 2) MS Word® background literature review and bibliography
Task 2	U.S. federal departments,' agencies,' and institutions' national security, homeland security, and environmental point-of-contact leads and consultants	Identified potential point-of-contacts and referral resources	1) MS® Excel based spreadsheet list of potential participant and stakeholder names, organizations, and contact information

Task 3	National security, homeland security, and environmental practitioners' definitions of environmental security, perspectives on U.S. environment & security linkages, general and institution-specific commonalities, institutionally relevant environmental issues, relevant capability needs and opportunities and follow up contacts	1) Identified range of participant understanding and definitions for environmental security 2) Agreement / disagreement with common elements for environmental security 3) Identified institutional common elements and areas of concern 4) Identified strategic / operational capability needs / resources 5) Identified follow up contacts	1) MS Word® survey with consent disclosures approved by GMU HSRB 2) MS Word® survey responses 3) MS Word® based summary of definitions, common element agreement and issues identified 4) MS Excel® definitions, common elements preferences, applicability of common elements and environmental issues, and capability needs / resources 5) MS Excel® list of potential Task 4 workshop participants
Task 4	National security, homeland security, and environmental practitioners' and stakeholders' perspectives of Task 3 findings, applicability to institutions' missions, institutional needs and capabilities, and responsible individuals	1) Identified and validated common elements for environmental security 2) Identified applicability to mission, strategic planning, and operational function 3) Identified general federal and institution specific needs 4) Identified capabilities, resources, and contacts 5) Participant education and ownership development	1) MS Word® based summary of common elements and issues identified in Task 3 2) MS PowerPoint® background presentation 3) MS Word® based findings thesis report (pre-final) 4) MS Excel® list of potential follow up contacts for use in Task 5
Task 5	Project participant and stakeholder feedback and comments on preliminary findings	1) Written comment revision implications for the thesis pre-final draft 2) Final thesis report	1) MS Word® document appendix of comments received 2) MS Word® and Adobe PDF® final project findings report 3) HTML based web page download capability making the thesis project resources available to participants, stakeholders, and public

Using these detailed outputs, the following chapters discuss in detail the data, results, analysis, and minor research scope updates made during the course of the project. Additional details on the specific materials generated as part of this methodology are in the thesis appendices.

CHAPTER 4: FEDERAL NATIONAL AND HOMELAND SECURITY MISSION AND FUNCTIONAL ANALYSIS

Early in this project, preliminary literature reviews identified that many of the existing environmental security studies and resources were geared toward defining the concept of environmental security (Glenn *et al.* 1998; King 2000; King 2008). The keystone definitional studies generally seemed to be consensus-based models that identified their participants, consultants, and contributors using a broad array of defense-oriented international and diplomatic sources (e.g., embassy military attachés)(Glenn *et al.* 1998; Kingham 2006). Given these previous projects' scopes and approaches, this research project's efforts are intended to focus more specifically on U.S. national and homeland security communities. I wanted to inclusively identify these communities by examining the current U.S. federal government departments and agencies that were responsible for national and homeland security related missions, functions, and/or responsibilities. As described in Chapter 3, this was initially accomplished through a focused literature review under the Task 1: Federal National and Homeland Security Mission and Functional Analysis efforts.

Building on King's (2000) practical approach, this review and analysis effort drew on publicly available literature to identify U.S. federal departments' and agencies' national and homeland security missions and functionalities. Understanding U.S. departments' and agencies' missions and functions is important in two ways. First, it

helped to provide some leads and information to assist with the identification of the relevant participants and stakeholders (under Task 2) that might be potentially interested in responding to the email survey instrument (Task 3) and the later one-day focus group workshop (Task 4) (Kingham 2006; Crate 2006; Dessai *et al.* 2004). Second, and most pertinent to this chapter, this review identified the U.S. Government's departments, agencies, and establishments that have national and homeland security missions and functions. The relevance of such mandates is highly pertinent to the organizations' potential interest in the environmental security topic's implications.

Originally, I intended the Task 1 literature review to be a narrowly focused research effort that was to collect and analyze documents, such as the U.S. National Security Strategy (NSS), U.S. National Military Strategy (NMS), DOD Directives, and other relevant strategic guidance documents. This was initially intended to help develop better understanding of U.S. national security players, their mandates, and their functions. My early efforts in spring of 2008 leveraged this initial literature review approach and, as such, successfully helped identify directly relevant topics and challenges that potentially could be addressed through environmental security, such as energy, climate change, water, hazardous materials / contaminants, sustainability, etc. As planned, this early research and compilation of national and homeland security documents did develop important background for identifying U.S. federal department and agency missions and how environmental security concepts could help address those needs. These more in-depth findings are elaborated later in this chapter.

Broadening The Net:

However, as my literature review continued into early summer of 2008, it became clear that a narrow national and homeland security mission and functionality focus would miss important value added and later partnering opportunities presented by the environmental security concept. Furthermore, my exposure to DODD 3000.5 and emerging human security oriented materials and personnel confirmed the need and utility to engage in a broader and more systematic department / agency review of mission and organizational structures. As such, I developed an expanded hierarchy and list of agencies with their respective missions to systematically analyze the U.S. Government through both the environment and security perspectives.

In trying to determine the most appropriate approach, my research approach was inspired by Dr. W.C. King's recent paper presented at the NATO Security Science Forum on Environmental Security and his thoughtful linkage of the human-environment dynamic and basic human security concepts to the core values expressed in the American Declaration of Independence (King 2008). With this in mind, I thought about the most basic mandate and guidance document for the U.S. Government, the U.S. Constitution. Based on this foundation, the U.S. Government's current structure is illustrated in Figure 3 below as extracted from the U.S. Government Manual (GPO 2007).

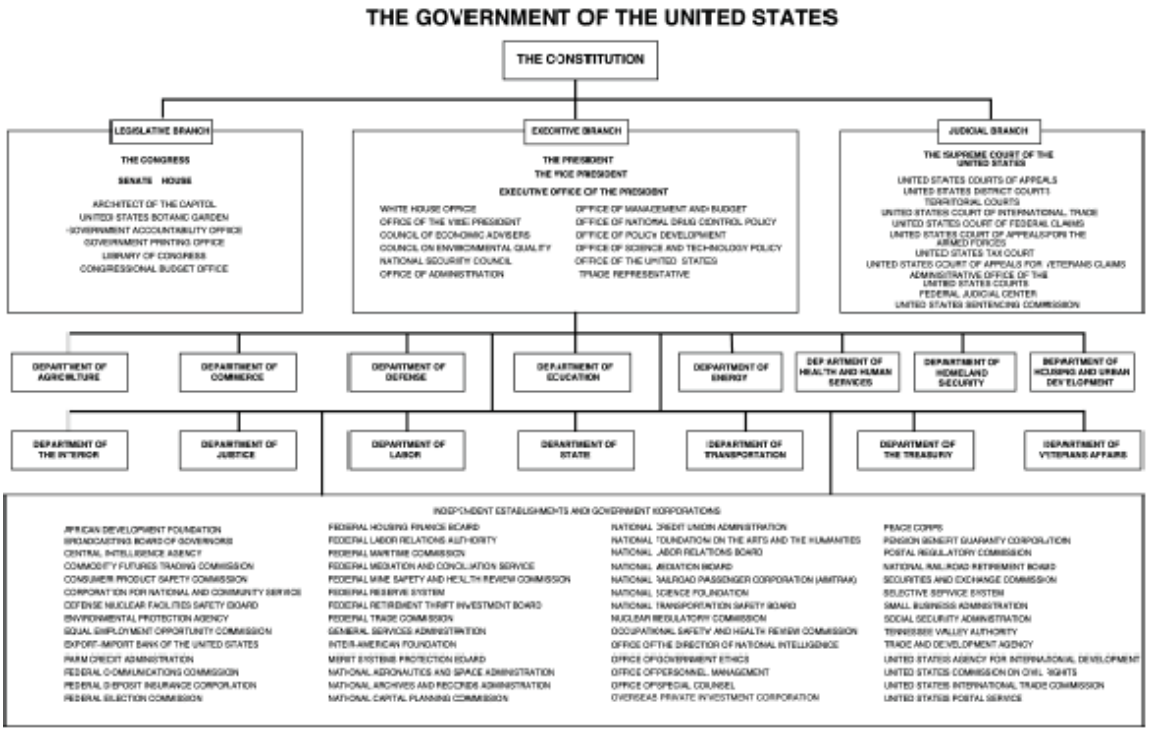

Figure 3: The Government of the United States (GPO 2007)

U.S. Government's Executive Branch Organization and Function:

This research project's action-oriented nature and desire to operationalize the environmental security concept lead me to focus on the U.S. Government's Executive Branch departments and agencies. Throughout the U.S. Executive Branch, the ultimate executive and policy decision-making authority rests with the President of the United States as authorized by Article II, Section 1 of the U.S. Constitution (GPO 2007). As such, the U.S. President's purview and authority covers all aspects of national security, homeland security, and environmental topics, policies, strategy, planning, and implementation activities within the U.S. Government (GPO 2007). The U.S. President is also the Commander in Chief for all U.S. Armed Forces (White House No Date (a)). Per Article 2 of the U.S. Constitution, the President is served and advised by his Cabinet

which is composed of the U.S. Vice President, Secretaries of the 15 Executive Departments, and designated Cabinet Rank members (White House No Date (b)). Initially authorized under the Reorganization Act of 1939, the Executive Office of the President and its respective entities also serve and advise the U.S. President on important issues of national interest (GPO 2007; White House No Date (a)).

National Security Structures and Organization:

While continually evolving to meet current daily needs, the Executive Branch's contemporary foreign policy and national structures were originally established in the post-World War II period and resulted from the National Security Act of 1947 and the Security Act Amendments of 1949 (U.S. State Department No Date; White House No Date (c)). As part of the Executive Office of the President, the National Security Council (NSC) continues to be the primary mechanism for discussing, integrating, coordinating, and advising the President on both short-term and long-term domestic and foreign national security policy issues (i.e., military, intelligence, economic, or otherwise)(GPO 2007; White House No Date (c); U.S. State Department No Date). The NSC's core members consist of the President, Vice President, Secretary of State, and Secretary of Defense (U.S. State Department No Date). The NSC's statutory military and intelligence advisors are the Chairmen of the Joint Chiefs of Staff (JCS) and the Director of National Intelligence (DNI), respectively (GPO 2007). As with previous Presidential Administrations, the NSC's operations and participant members are customized to meet the current President's national security advisory needs, priorities, and decision-making processes (U.S. State Department No Date; White House No Date (c)). The NSC's

current "standing participants" also include the Secretary of the Treasury, White House Chief of Staff, Counsel to the President, Assistant to the President for National Security Affairs, Assistant to the President for Economic Policy as well as the senior leaders from other executive departments and agencies, as relevant and appropriate (GPO 2007: 92; White House No Date (c)). The NSS is the elaboration of the President's strategic national security vision and policy intent for the Nation, and it is largely a product of the deliberations and advice coordinated through the NSC mechanism (Bush 2006). The NSS provides the policy mandates and overarching strategic goals for the use of all "elements of national power" (Jablonsky 2008: 9). This "Grand Strategy" approach provides flexible guidance to the relevant U.S. government department's national security missions and strategies (Jablonsky 2008: 9).

Homeland Security Structures and Organization:

Figure 4: National Strategy (Jablonsky 2008)

While the NSC is the primary national security policy advisory and coordinating body serving the President, the events of September 11th, 2001 spurred some of the largest changes in the U.S. Government's national security structures since the National Security Act of 1947 (Bush 2002; GPO 2007; U.S. State Department No Date). In October 2001, the Homeland Security Council (HSC) was established under E.O. 13228 and Homeland Security Presidential Directive-1 to "advise…the President" and coordinate U.S. Government "policies and functions" on Homeland Security matters (U.S. Congress 2002: 2259;

White House No Date (d)). The HSC's core members consist of the President, Vice President, Secretary of Homeland Security, Secretary of Defense, and the Attorney General (U.S. Congress 2002). Like the NSC before it, the HSC also has flexibility to include additional Executive Branch department heads and leaders to meet the President's needs and requirements (U.S. State Department No Date; White House No Date (d)). As such, the HSC current standing participants also include the Director of the Federal Bureau of Investigation, Director of National Intelligence, Secretary of Health and Human Services, Secretary of Transportation, Secretary of the Treasury, and Assistant to the President for Homeland Security and Counterterrorism (White House No Date (d)). Other senior leaders and advisors that contribute to the HSC discussions are the President's Chief of Staff, Counsel to the President, Assistant to the President for National Security Affairs, Vice President's Chief of Staff, Director of the Office of Management and Budget, and Chairman of the Joint Chiefs of Staff (White House No Date (d)). In addition to codifying the HSC mechanism, the later Homeland Security Act of 2002 established the Department of Homeland Security (DHS) and statutorily brought concept of "homeland security" into the U.S. Government's national security lexicon (U.S. Congress 2002: 2140). In a manner similar to the NSS, the National Strategy for Homeland Security (NSHS) is the description of the President's strategic homeland security vision and intent for the Nation (HSC 2007).

National Security Versus Homeland Security:

However, for the purposes of this research project, the question emerged to the nature and differentiation between the understanding of national security and homeland security. From a statutory perspective, the Homeland Security Act of 2002 specifically defined the " 'American homeland' or 'homeland' means the United States, in a geographic sense," and, later stated that "'homeland security' refers to those activities that detect, deter, protect against, and respond to terrorist attacks occurring within the United States and its territories" (U.S. Congress 2002: 2258). When compared to the scope of national security and its respective U.S. Government missions, the concept of homeland security is very limited in its conceptual reach. While understandable in its development and emphasis, one can certainly appreciate the critiques of strategic thinkers, such as Thomas P.M. Barnett (2005), about the artificial boundaries that this concept places on strategic thought when trying to think comprehensively about U.S. national security. Barnett bluntly states that important "nation-building and disaster-response" resources and "capabilities…are trapped within DHS" and effectively "wasted" because of the narrow definition of homeland security (2005: 327). In the wake of Hurricane Katrina and Rita, this conceptual definition's limitations were effectively confirmed by the 2007 NSHS, which states that "effective preparation for catastrophic natural disasters and man-made disasters, *while not homeland security per se,* can nevertheless increase the security of the Homeland" (HSC 2007: 3, *emphasis added*). This National Strategy now also predominately emphasizes an evolving approach with extensive partnership and collaboration both within and outside of the federal family.

Yet, those that established DHS rightly recognized that the core mission functions that support the security of the American public were previously fragmented and resided within over 100 different government organizations (Bush 2002; U.S. Congress 2002). DHS's basic purpose of a more unified strategy and coordinated efforts for increased security is commendable but potentially too hierarchically centralized and detrimentally narrow in scope (DHS 2007). While acknowledging the limitations of the homeland security paradigm, I would likewise strongly emphasize that DHS's formidable capabilities and resource portfolios should be cooperatively and creatively leveraged for the pursuit of national security interests, strategy, and objectives, as practical.

Broadened Mission Functional Analysis Approach and Methods:

As described earlier in this chapter, I conducted a broadened mission functional analysis to more systematically understand the environmental security relevant mission interests of U.S. Government's Executive Branch entities, departments, agencies, establishments, and government corporations. I started by compiling a list of the departments within the U.S. President's Cabinet (and Cabinet Rank), organizations within the Executive Office of the President and U.S. federal government agencies. I developed this database using both the U.S. Government Manual and The White House's Government Web Page resources (GPO 2007; White House No Date (a); White House No Date (b); White House No Date (e)). Next, I compared these respective lists for redundancy. Then, I compiled them into a master list database with data elements including their name, web page address, and type (i.e., Executive Office organizations,

Cabinet level departments, federal agencies, independent establishments / government corporations). Through this process, I found that of the 179 resulting departments / agencies / organizations records, over 100 of the U.S. Executive Branch organizations seemed directly relevant to security, environment, development, science & technology (S&T), economy, health, or other human security mission functionalities. Then, I located and captured the mission statements and organizational structures for each of the 100-plus environmental and security relevant departments, agencies, and organizations. I analyzed and distilled their respective mission statements into primary mission keyword (i.e., security, environment, development, etc.) and scope categories (i.e., domestic, international, or both). I also used addition, organizational structure information and materials to characterize the overall functional hierarchy between cabinet departments and the respective federal agencies. Lastly, I further characterized the primary mission functional areas of security, environment, and development relevance into binary data elements (Yes or No). While not likely to be fully comprehensive, this broad approach enabled an initial top-down mission functional analysis to identify a baseline of federal government entities that could potentially have their mission served through the operationalization of the environmental security paradigm. The results are presented below along with the contextual background identified through the on-going literature review.

Security Mission Functional Analysis Results:

I developed a pragmatic mission functionality analysis and categorization scheme to present the relevant Executive Branch entities, departments, and organizations that respected the homeland security concept's geographic scope. Since this study's intent is to focus on the intersection of security and environmental issues (i.e., environmental security), the aforementioned human security paradigm suggested that a more broadly inclusive process would be required to successfully explore the integrative nature of the environmental security concept and identify potential mission synergies for real world planning, operations, and activities. The federal mission functional analysis provided below is hierarchically organized and categorized by international / domestic and domestic only orientations. While maintaining a more broad human security emphasis, these results are presented in a way that explicitly recognizes the potential national security versus homeland security-centric conceptual issues reflected within the current federal entity, departmental, and agency mission statements. The identified **Executive Office of the President entities and Cabinet level departments** with **security** relevant missions are provided in Table 3 below.

Table 3: Executive Office / Cabinet Departments with Security Missions

International and Domestic Orientation	
Entity / Department / Agency	***Mission Keyword***
• Office of Vice President	Security, Economy, and Environment
• White House Chief of Staff	Security, Economy, and Environment
• National Security Council	National Security
• Homeland Security Council	Homeland Security
• President's Intelligence Advisory Board and Intelligence Oversight Board	Security and Intelligence

International and Domestic Orientation	
Entity / Department / Agency	***Mission Keyword***
• Office of Science & Technology Policy	Technology, National Security, Economy, and Environment
• Office of National Drug Control Policy	National Security
• White House Military Office	Security
• Department of Defense	National Security
• Department of Justice	Security
• Department of State	Security, Development, Economy, and Environment
• Department of Transportation	Infrastructure, Economy, and National Security
• Department of the Treasury	National Security and Economy
Domestic Orientation	
Entity / Department / Agency	***Mission Keyword***
• Department of Homeland Security	Homeland Security
• Department of Energy	National Security, S&T, Environment and Economy
• Department of Health & Human Services	Health, Homeland Security, and Technology

These security-oriented Executive Office of the President entities advise the President and coordinate the interagency pursuit of the NSS through the respective Cabinet level departments, agencies, and independent establishments. Before delving into the Federal Agencies, Independent Establishments & Government Corporations mission functional analysis below, it is useful to also briefly elaborate the military and civilian chain of command to understand the decision-making, planning, and implementation processes. As depicted previously in Figure 3, the President is the Chief Executive for the U.S. Government's Executive Branch, and, based upon the NSC and HSC advice, provides strategic security vision and directives to the respective heads of the cabinet level department and independent establishment (GPO 2007). Likewise, in

terms of the U.S. military chain of command, the President is the "Commander in Chief" and makes an executive decision that authorizes the Secretary of Defense with a strategic mission and objectives, who then, in coordination with the Joint Chiefs of Staff, tasks the responsible Combatant Commander(s) (COCOMs) (GlobalSecurity 2003; U.S. Army 2008; JCS 2008). Under the Unified Command Plan, the responsible COCOMs then plans, coordinates, and implements the strategic mission within their "area of responsibility" (see Figure 5 below) among the various service branches and commands (JCS 2008: II-12; GlobalSecurity 2003; U.S. Army 2008).

Figure 5: Unified Command Plan Map (U.S. Army 2008)

Whether civilian or military, the chain of command again closely aligns with the National Strategy approach as shown in Figure 4. While parallel to civilian agency processes, the "art and science" of strategic processes for the U.S. military is hierarchical to respect the direct civilian leadership and control of the Armed Forces as well as to maximize conformance to the "Principles of War" and its keystone Unity of Command principle (Yarger 2008: 45; JCS 2008: II-2).

> ***National Security Strategy:*** *The art and science of developing, applying and coordinating the instruments of national power (diplomatic, economic, military, and informational) to achieve objectives that contribute to national security.*
>
> ***National Military Strategy:*** *The art and science of distributing and applying military power to attain national objectives in peace and war.*
>
> ***Theater Strategy:*** *The art and science of developing integrated strategic concepts and courses of action directed toward securing the objectives of national and alliance or coalition security policy and strategy by the use of force, threatened use of force, or operations not involving the use of force within a theater.*
>
> (Yarger 2008: 44-45)

This strategic thought and mission definition process is important to better understand the critical decision-making junction and policy definition processes. For instance, Figure 6 provides an outline of the application and outputs of the U.S. national security strategy development and definition process. While the NSS is the U.S. President's strategic vision and goals, the Office of the Secretary of Defense (OSD) then aligns that mission into strategic objectives that flow from the NSS principles as well as also incorporate capability inputs from the Quadrennial Defense Review (QDR) and other DOD sources (DOD 2008; JCS 2004). Then, continuing the alignment with NSS

goals, the JCS develops and outputs the NMS, which serves to "implement" and "focus … military activities" across the DOD and its respective service branches through the definition of objectives (JCS 2004: viii).

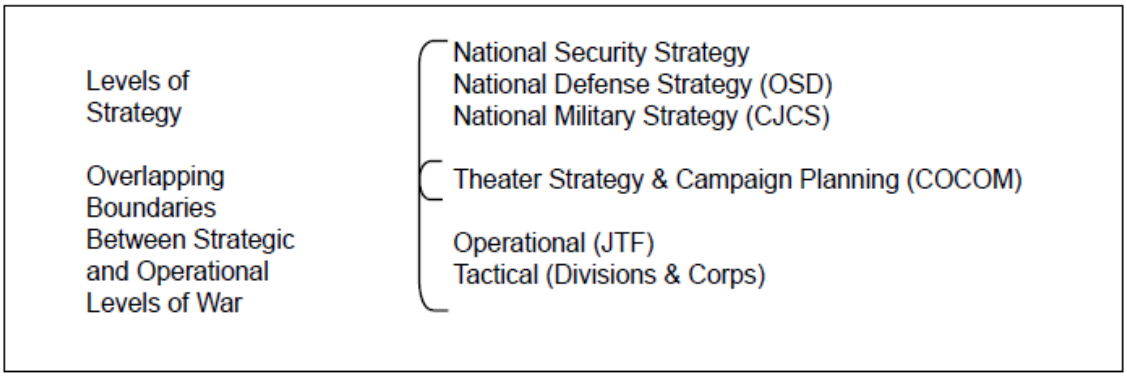

Figure 6: Strategic and Operational Art (Yarger 2008)

Likewise, the vision and goals set forth in the NSS spur the relevant civilian departments develop their own mission and strategic plans, who also seek to align their goals and objectives to the higher level NSS. For example, the civilian U.S. Department of State operates on the opposite end of the critical national security spectrum from the DOD's military activities, but develops its own mid-term strategic plan, such as the FY 2007-2012 Department of State and USAID Strategic Plan (U.S. State Department 2007). This mission and strategic framework specifically aligns the

Figure 7: National Strategy and the Vertical Continuum of War (Jablonsky 2008)

NSS's "tasks" to the development of the State Department's [and U.S. Agency for International Development (USAID)] "strategic goals," which are then organized into its framework of programmatic activities (U.S. State Department 2007: 11). While only one example, the foreign diplomacy and development strategic goals and activities of the Department of State and USAID show how the NSS vision is translated down to the respective departments and their contribution to national instruments of power (Figure 7).

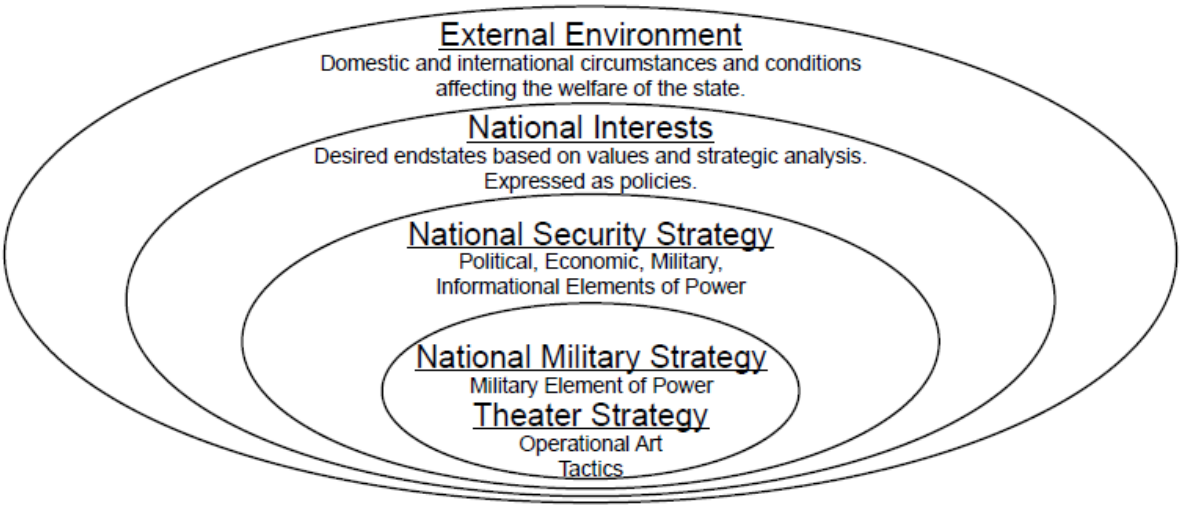

Figure 8: Comprehensive Strategy (Yarger 2008)

Given this background, it is useful to understand how these policymaking and strategic level processes flow down to the respective cabinet departments, influence their missions and goals, and, then, influence their respective agencies' missions. With these processes in mind and using the previously described approach, a lower-level mission functional analysis was performed for the agencies, establishments, and government corporations and identified their hierarchical relations to Cabinet level departments,

where applicable. When examined for security missions, the following agencies, establishments, and government corporations were identified and categorized in a manner similar to the Executive Office and Cabinet level analysis results above. The identified **Federal Agencies, Independent Establishments and Government Corporations** with **security** relevant missions are presented in Table 4 below.

Table 4: Federal Agencies / Institutions with Security Missions

International and/or Domestic Orientation	
Department / Agency / Institutions	***Mission Keyword***
• Department of Defense	
○ Department of the Air Force	Security
○ Department of the Army	Security
▪ U.S. Army Corps of Engineers	Security, Environment, Infrastructure, and S&T
○ Department of the Navy	Security
▪ U.S. Marine Corps	Security
○ Ballistic Missile Defense Organization	Security
○ Defense Advanced Research Projects Agency	National Security and S&T
○ Defense Information Systems Agency	National Security and S&T
○ Defense Intelligence Agency	Security and Intelligence
○ Defense Logistics Agency	Security
○ Defense Security Cooperation Agency	Security and Development
○ Defense Security Service	Security, Intelligence, and S&T
○ Defense Threat Reduction Agency	Security
○ National Geospatial-Intelligence Agency	National Security, Intelligence, and S&T
○ National Security Agency	National Security and Intelligence
• Department of Homeland Security	
○ U.S. Customs and Border Protection	Security
○ United States Secret Service	Security
• Department of State	
○ Bureau of Arms Control	Security
• Department of Justice	
○ Drug Enforcement Administration	Security
○ Federal Bureau of Investigation	Security and Intelligence
• Department of Commerce	
○ Bureau of Industry and Security	S&T, Security, and Economy
• Independent Establishments & Commissions	
○ Office of the Director of National Intelligence	Intelligence and Security

International and/or Domestic Orientation	
Department / Agency / Institutions	***Mission Keyword***
○ Central Intelligence Agency	Security and Intelligence
○ U.S. Institute of Peace	Security and International
○ Broadcasting Board Governors	Security and Social
▪ Voice of America	Security and Social
○ Organization of American States	Development, Security, Social, Economy, Environment, and S&T
Domestic Orientation	
Department / Agency / Institutions	***Mission Keyword***
• Department of Justice	
○ Bureau of Alcohol, Tobacco, & Firearms	Security
○ National Institute of Justice	Security
○ U.S. Marshals Service	Security
• Department of Homeland Security	
○ Domestic Nuclear Detection Office	Security and S&T
○ Federal Emergency Management Agency	Homeland Security
○ Federal Law Enforcement Training Center	Security & Education
○ Immigration and Customs Enforcement	Security, Infrastructure, and Economic
○ Transportation Security Administration	Security, Infrastructure, and S&T
○ U.S. Citizenship and Immigration Services	Security and Social
○ United States Coast Guard	Security, Economy, and Environment
• Department of Defense	
○ Pentagon Force Protection Agency	Security and Infrastructure
• Department of Commerce	
○ National Institute of Standards & Technology	S&T and Security
• Department of Health and Human Services	
○ Food & Drug Administration	Health and Security
• Independent Establishments & Commissions	
○ Defense Nuclear Facilities Safety Board	Environment and Security
○ Federal Energy Regulatory Commission	Infrastructure and Security
○ Nuclear Regulatory Commission	S&T and Security
○ Selective Service System	Security
○ Defense Information Systems Agency	National Security and S&T
○ Defense Intelligence Agency	Security and Intelligence
○ Defense Logistics Agency	Security
○ Defense Security Cooperation Agency	Security and Development
○ Defense Security Service	Security, Intelligence, and S&T
○ Defense Threat Reduction Agency	Security
○ National Geospatial-Intelligence Agency	National Security, Intelligence, and S&T

Environmental Structures and Organization:

As part of the broader functional analysis described earlier in this chapter, my Executive Branch research efforts also included the identification of government organizations with environmentally related missions. While the U.S. Congress has historically played a large part in leading environmental initiatives, the President's role of the Chief Executive is extremely significant because of the authority exercised over environmental programs throughout the "policy cycle" via agenda setting, budgeting, staffing, regulatory oversight, and executive order directives (Vig 2005: 101). In addition, the President's authority to sign or reject international treaties and to define military missions (and their respective environmental impacts) highlights the important influence and leadership on environmental matters within both foreign and domestic spheres (Vig 2005).

Within the Executive Office of the President, the Council on Environmental Quality (CEQ) is the primary entity that supports the President on environmental policy and strategy matters (GPO 2007). Authorized by the landmark National Environmental Policy Act of 1969 (NEPA), the CEQ was established to provide the President with national policy advice and interagency coordination for the purpose of improving our Nation's environment (GPO 2007). In addition to providing oversight of federal departments' and agencies' NEPA compliance, the CEQ's aim is to "bring into productive harmony the Nation's social, economic, and environmental priorities, with the goal of improving the quality of Federal decision making" (GPO 2007: 91). At the same level, the Office of Science & Technology Policy (OSTP) provides advice to the

President on environmental matters involving "science, technology, and engineering" (Kraft and Vig 2005: 7).

Environment Mission Functional Analysis Results:

While these Executive Office level institutions advise and assist the President, some public policy analysts have suggested that the current environmental agenda setting, policy development, coordination, and implementation at the departmental and agency levels may be bedeviled by institutionally fragmented missions and responsibilities (Kraft and Vig 2005). In addition to this Executive Branch fragmentation, it seems that the White House's primary interest in "Protecting Our Nation's Environment" may suffer from the same domestic scope limitation as the aforementioned homeland security paradigm (White House No Date (f)). As national security is defined in terms of "interests," this institutional mission functional analysis has also endeavored to inclusively identify all departments and agencies with mission domain over environmentally related national interests whether foreign or domestic (Gates and Cartwright 2008). The identified **Executive Office of the President entities and Cabinet level departments** with **environmentally** relevant missions are provided in Table 5 below.

Table 5: Executive Office / Cabinet Departments with Environmental Missions International and Domestic Orientation

Entity / Department / Agency	***Mission Keyword***
• Office of Vice President	Security, Economy, and Environment
• White House Chief of Staff	Security, Economy, and Environment
• Council on Environmental Quality	Environment
• Office of Science & Technology Policy	Technology, National Security,

International and Domestic Orientation	
Entity / Department / Agency	***Mission Keyword***
	Economy, and Environment
• Office of the Federal Environmental Executive	Environment
• Department of Agriculture	Environment
• Department of Commerce	Economy and Environment
• Department of State	Security, Development, Economy, and Environment
Domestic Orientation	
Entity / Department / Agency	***Mission Keyword***
• Department of Energy	National Security, S&T, Environment and Economy
• Department of the Interior	Environment
• Environmental Protection Agency	Environment

The identified **Federal Agencies, Independent Establishments and Government Corporations** with **environmentally** relevant missions are provided in Table 6 below.

Table 6: Federal Agencies / Institutions with Environmental Missions

International and/or Domestic Orientation	
Department / Agency / Institutions	***Mission Keyword***
• Department of Commerce	
○ National Oceanic & Atmospheric Administration	Environment, Economy, and Social
• Department of Defense	
○ Department of Army	Security
▪ U.S. Army Corps of Engineers	Security, Environment, Infrastructure, and S&T
• Department of the Interior	
○ U.S. Fish and Wildlife Service	Environment
• Department of State	
○ U.S. Agency for International Development	Development, Economy, Health, and Environment
• Independent Establishments & Commissions	
○ National Aeronautics and Space Administration	S&T and Environment
○ National Science Foundation	S&T and Environment
○ Peace Corps	Development, Environment, Social, and Economy

International and/or Domestic Orientation	
Department / Agency / Institutions	***Mission Keyword***
○ Organization of American States	Development, Security, Social, Economy, Environment, and S&T
Domestic Orientation	
Department / Agency / Institutions	***Mission Keyword***
• Department of the Interior	
○ National Park Service	Environment
• Department of Homeland Security	
○ United States Coast Guard	Security, Economy, and Environment
• Department of Commerce	
○ National Technical Information Service	S&T, Economy, and Environment
• Department of Agriculture	
○ Natural Resource Conservation Service	Environment
○ U.S. Forest Service	Environment
• Independent Establishments & Commissions	
○ Chemical Safety and Hazard Investigations Board	Environment
○ Defense Nuclear Facilities Safety Board	Environment and Security
○ Nuclear Regulatory Commission	S&T, Security, and Environment
○ Tennessee Valley Authority	Development, Economy, and Environment

Triangulated Cross-Check of Environmental Mission Results:

To augment the inclusiveness of this mission functionality approach, I also briefly compared the results presented below to an earlier study developed by Kraft and Vig (2005) on Executive Branch Agencies with Environmental Responsibilities. Upon comparison of results, it was found that both approaches triangulated the same primary and secondary departments and agencies with environmental mission responsibilities. First, both approaches identified the Environmental Protection Agency (EPA), Department of the Interior (DOI), and Department of Agriculture (USDA) as the primary environmental organizations. Second, Kraft and Vig (2005) also asserted that DOD,

Department of Energy (DOE), and Department of State (DOS) all have strong emerging environmental and natural resource responsibilities, which is consistent with this project's mission functionality review. However, when compared against the Kraft and Vig (2005) study's identified Executive Branch departments and agencies with environmental responsibilities, it was found that my mission functional analysis results did not include Department of Justice (DOJ), Department of Labor (DOL), Department of Transportation (DOT), Department of Housing and Urban Development (HUD), and Department of Health & Human Services (HHS). However, upon further review, it seemed that these omissions resulted from an analysis scope differences between the two methodologies and the environmental responsibilities that were not elaborated at the mission statement level. Given the desire for inclusiveness, DOJ, DOL, DOT, HUD, and HHS were all included in the environmental and security analysis.

Security and Environment Mission Functional Analysis Results:

Based upon the prior security and environment results, the intent of this analysis is to explore the potential intersection of security and environmental mission functionalities throughout the Executive Branch entities, departments, and agencies. Again, while this is not meant to be entirely comprehensive, this broad approach should represent a base reference point of the core Executive Brand entities. Identified departments, agencies, and establishments could potentially have their various missions served through the operationalization of the environmental security paradigm. The identified **Executive Office of the President entities and Cabinet level departments** with **security** and **environmentally** relevant missions are provided in Table 7 below.

Table 7: Executive Office / Cabinet Departments with Security and Environmental Missions

International and Domestic Orientation	
Entity / Department / Agency	***Mission Keyword***
• Office of Vice President	Security, Economy, and Environment
• White House Chief of Staff	Security, Economy, and Environment
• Office of Science & Technology Policy	Technology, National Security, Economy, and Environment
• Department of State	Security, Development, Economy, and Environment
• Department of Health & Human Services (K&V)	Health, Homeland Security, Technology and Environment
• Department of Justice (K&V)	Security and Environment

The identified **Federal Agencies, Independent Establishments and Government Corporations** with **security** and **environmentally** relevant missions are provided in Table 8 below.

Table 8: Federal Agencies / Institutions with Security and Environmental Missions

International and/or Domestic Orientation	
Department / Agency / Institutions	***Mission Keyword***
• Department of Defense	
○ Department of Army	
▪ U.S. Army Corps of Engineers	Security, Environment, Infrastructure, and S&T
• Independent Establishments & Commissions	
○ Organization of American States	Development, Security, Social, Economy, Environment, and S&T
Domestic Orientation	
Department / Agency / Institutions	***Mission Keyword***
• Department of Homeland Security	
○ United States Coast Guard	Security, Economy, and Environment
• Independent Establishments & Commissions	
○ Defense Nuclear Facilities Safety Board	Environment and Security

Development Mission Functional Analysis Results:

While not explicitly security or environment, organizational missions focusing on both foreign and domestic development issues are logical and key stakeholders in any environmental security efforts. As environmental security issues can fall under the human security paradigm, keeping an inclusive perspective with respect to potential stakeholders enables a more comprehensive and successfully exploration of the environmental security concept. As development related missions were part of the broader mission functional analysis, the development mission institutions identify below could also represent important potential mission synergies for real world pre/post-conflict planning, operations, and activities. Specifically, development mission partners could possess unique knowledge, capabilities, and means to better implement environmental security related efforts and missions both at home and abroad. As such, the same functional analysis approach resulted in the following department, agency, and government establishments, which have development components within their institutional missions. The only identified **Executive Office of the President entities and Cabinet level department** with a **development** relevant mission is the U.S. Department of State. However, I did identify several **Federal Agencies, Independent Establishments and Government Corporations** with **development** relevant missions, and these are provided in Table 9 below.

Table 9: Federal Agencies and Institutions with Development Missions

International and/or Domestic Orientation	
Department / Agency / Institutions	***Mission Keyword***
International and/or Domestic Orientation	
• Department of State	
○ Agency for International Development	Development, Economy, Health, and Environment
• Department of Defense	
○ Defense Security Cooperation Agency	Security and Development
• Independent Establishments & Commissions	
○ African Development Foundation	Development and Economy
○ Inter-American Foundation	Development, Economy, and Social
○ Overseas Private Investment Corp.	Development, Social, and Economy
○ Peace Corps	Development, Environment, Social, and Economy
○ Trade and Development Agency	Development, Economy, Social, and Infrastructure
○ American Development Bank	Development, Economy, and Social
○ International Bank for Reconstruction & Development	Development, Economy, and Social
○ International Labor Organization	Development, Economy, and Social
○ Organization of American States	Development, Security, Social, Economy, Environment, and S&T
Domestic Orientation	
Department / Agency / Institutions	***Mission Keyword***
• Department of Housing and Urban Development	
○ Ginnie Mae	Development
• Independent Establishments & Commissions	
○ Appalachian Regional Commission	Development, Economy, and Infrastructure
○ Neighborhood Reinvestment Corporation	Development and Social
○ Tennessee Valley Authority	Development, Economy, and Environment

Institutional Stakeholder Landscape:

The U.S. Joint Chiefs of Staff stated that the "United States must adopt a global posture and take action to *prevent conflict and surprise attack*" (JCS 2004: 2, *emphasis added*). To do so, the U.S. Government's own national security strategy seems to

emphasize the necessity of exercising every instrument of national power to "shape the security environment" and strengthen "alliances and coalitions [to] contribute to mutual security" (JCS 2004: 2). Taking this security imperative at face value, the mission functional analysis presented in this chapter helps initially identify potential institutional level stakeholders within the Executive Branch of the U.S. Government. In doing so, it is a good first step in trying to understand the scope and potential of leveraging the environmental security concept within the federal community. Building on this understanding, the next chapter explores the understandings of environmental security through a sample of the national security, homeland security, and environmental professionals working within (and with) some of the identified departments, agencies, and establishments.

CHAPTER 5: ENVIRONMENTAL SECURITY DEFINITION AND UNDERSTANDING SURVEY RESULTS

This project's primary field research component was the email survey of potentially interested national security, homeland security, and environmental professionals. I identified target participants and logged them into a contact and tracking database developed through the Task 1 & 2 literature review efforts. An electronic survey was distributed and administered via email to identified professionals in the form of six consecutive email mailings from April 2008 through August 2008. This email included the brief MS Word® survey form, a project description and an informed consent disclosure addendum.

The goals of this survey were to:

1) Identify participants' individual and/or agency's definition and understanding of environmental security;
2) Assess their agreement with, relevance, and applicability of identified definitional components (e.g., Glenn *et al.* 1998: 19);
3) Identify environmental security's use and/or perceived relevance to their professional work;
4) Explore participants' thoughts on policy, functional implications and relation to sustainability issues;
5) Better understand their institution's relevant environmental security capabilities and coordination responsibilities;
6) Identify related capability gaps and examples of their impacts, if available; and

7) Determine their interest to participate in the Task 4 workshop.

While initially intended to be one email survey push, I determined that a rolling group distribution approach would enable a more flexible and successful electronic survey response rate. First, it allowed the use of small groups of survey emails (less than 50 emails sent per group) with several groups making up the email pushes. These smaller groups helped to avoid trigging numeric based firewall blocks when sending to multiple blind carbon copy recipients, particularly given the vast majority of these emails were sent to .mil email addresses. Second, the rolling groups of email pushes also allowed for the inclusion of newly identified potential survey participants at the Task 1 & 2 efforts continued well into early August 2008. This approach also allow for all participants to have a full four-weeks to complete and return the electronic survey instrument in all cases. All returned survey data forms were coded and extracted to a Task 3 results database.

I designed these survey questions to address the aforementioned survey goals. In this chapter, these responses are presented in a sequential, question by questions basis that are summarized by stakeholder groups. While the U.S. Government's national security, homeland security, and environmental communities were the primary target audience, the real world survey responses came from the Department of the Army, Department of the Air Force, intelligence, non-profit defense think tank organizations, Department of Homeland Security (DHS), federal environmental agencies, and non-profit development organizations. While the initial survey database included contacts across the U.S. Government's national security, homeland security, and environmental

communities, the initial respondents seemed to indicate a primary interest in environmental security from U.S. Army (including U.S. Army Corps of Engineers), U.S. Air Force, their staff and war colleges, intelligence community, defense support non-profits, federal environmental and natural resource managers, and a non-profit development organization. There was limited interest exhibited by DHS and no survey responses from diplomatic and maritime security institutions. While obviously limited by the identified contacts, this level of expressed interest may also be in itself an indicator of awareness of the environmental security concept and of its potential to contribute to their respective missions.

Of these groups and their unofficial responses, the understanding and comments received via the electronic survey seemed to be very consistent. While this survey is not a quantitative research effort, the binary (Yes/No) and follow up contextual responses provide an initial basis for trying to grasp the current understandings and status of environmental security concept in the context of the U.S. Government's national security and environmental communities. The following results are broken out and summarized by the survey's 17 primary questions along with their secondary follow up questions. This order was originally developed to build on the earlier questions while addressing the context of the survey's goals.

1. Have you heard the term environmental security?

Of the survey's respondents, 97% (31 out of 32) had heard of the term environmental security previously.

If yes, how would you define it?

Under Goal # 1, the survey participants were asked for their definition of environmental security. While the responses were diverse, it was important to better understand their respective personal definitions and/or understanding of environmental security. These diverse personal definitions have been summarized by group.

The **U.S. Army respondents** suggested that environmental security was a focus on the "inextricable" linkages between national security and environment (including natural resources) (ASR 2008). They cited a two-way linkage in the vulnerabilities and threats from elements that could both positively and negatively impact each other. The responses confirmed their acceptance that environmental issues impact U.S. national security objectives, such as water, energy, natural resources protection, contamination, climate change, etc. There was also the suggestion that negative environmental threats could "adversely impact … national security interests" and "contribute to increasing intrastate or broader regional instability and to the outbreak of conflict" (ASR 2008). The national security implications of economic, political and social instability in the developing world specifically focused on the destabilizing nature of population health and natural hazards.

There were also specific responses that introduced the need for an "interdisciplinary" environmental security analysis paradigm that could be used to more strategically understand these impacts by integrating "geographic, social, political, economic, and scientific-technological perspectives" (ASR 2008). In addition, one

respondent cited a process-oriented definition put forth by Dr. Alan Hecht of the National Security Council suggesting that:

> *Environmental Security is a process whereby solutions to environmental problems contribute to national security objectives. It encompasses the idea that cooperation among nations and regions to solve environmental problems can help advance the goals of political stability, economic development, and peace. In addition, by addressing the environmental components of potential security "hot spots threats to international security can be prevented before they become a threat to political or economic stability or peace."*
>
> (ASR 2008)

Another respondent put forth another process definition as advocated by Dr. King that:

> *Environmental security is a process for effectively responding to changing environmental conditions that have the potential to reduce peace and stability in the world. Environmental security involves identifying the critical issues and accomplishing environmentally related actions to prevent and/or mitigate anthropogenically induced adverse changes in the environment and minimize the impacts of the range of environmental disasters that could occur.*
>
> (King 2008: 2; King 2000: 17)

While complementary, **U.S. Air Force (USAF) respondents** suggested a wide spectrum of definitions from preventing environmental terrorism to ensuring USAF mission / U.S. quality-of-life sustaining environmental / natural resource base. The wide variety of definitions was instructive to demonstrate the diverse understandings of environment and security interactions within this sub-group. Overall, the focus throughout seemed to be on the defense, maintenance, and sustainment of critical environmental resource bases and natural capital with specific issues ranging from water scarcity to loss of biodiversity. Intentional attack and unintentional damage to the environmental resource base were also both cited as national security issues.

The limited **intelligence community response** indicated that environmental security issues were related to "environmental factors that influence U.S. national security interests" (ASR 2008).

Defense-related non-profit respondents provided a diversity of definitions from general to specific formal environmental security definition citations. The general definitions focused on interaction of human health, environment, and security on "international security and stability" and cited specific issues such as water, agriculture, ecosystems, energy, and climate change (ASR 2008). One respondent cited the mid-1990's U.S. NSS's limited "real-politik" definition that focused on nation-state centered security issues and environmental implications of maintaining standing defense infrastructure and forces (Ohlsson 1999: 27). Another presented The Millennium Project's definition stating that:

> *[E]nvironmental security as environmental viability for life support, with three sub-elements:*
> 1) *Preventing or repairing military damage to the environment,*
> 2) *Preventing or responding to environmentally caused conflicts, and*
> 3) *Protecting the environment due to its inherent moral value.*
>
> (AC/UNU Millennium Project 1998)

From the limited responses received, the participants with a **homeland security perspective** seemed to focus on protection of key environmental resources / infrastructure and maintenance of necessary natural resources. As part of this, respondents mentioned the need of such resources to ensure self-sufficient and enable effective response and recovery from both natural and manmade disasters.

Federal environmental professionals indicated that their definition of environmental security focused on the protection and maintenance of environmental

resources and ecological services to the benefit of U.S. citizens and their security. Responses also indicated an acknowledgement that there are efforts to prevent "intentional, accidental, or mismanagement" that impacts both environmental resources and citizen health (ASR 2008). These comments referenced the importance of environmental resources and services for national security as they enable the provision of water (quantity & quality), food, and "healthful living space" for people within a given area, which "prevent degradation of political and civil stability" (ASR 2008).

Likewise, **development-oriented non-profit respondents'** definition of environmental security related to maintaining viable environmental resources and services and their support for "human population[s] to secure, sustain and improve its quality of life" (ASR 2008). They further indicated that an aspect of the concept was that humans are part of the ecosystem and, as a result, "environmental degradation can lead to conflict" (ASR 2008).

Based upon your understanding, please respond in Questions # 2-6 regarding the topics that fall under environmental security?

Questions 2-6 of the survey were an important part of achieving survey Goals # 2 & 3. First, Questions 2a, 3a, 4a, 5a, & 6a responses (Yes/No) specifically assessed the respondents' definitional agreement with the components of environmental security as proposed by Glenn *et al.*, which supported Goal # 2 (1998: 19). Second, the Questions 2b, 3b, 4b, 5b, & 6b Yes/No responses and their subsequent explanations were to help understand the relevance and applicability of these definitional components to their

respective missions and operations, which helps achieve the remainder of Goal # 2 and part of Goal # 3.

2a. Would issues of "public safety from environmental dangers caused by natural or human processes (due to ignorance, accident, mismanagement, or design)" be included under environmental security?

In Question 2a, 86% of the respondents (25 out of 29) agreed that "public safety from environmental dangers caused by natural or human processes (due to ignorance, accident, mismanagement, or design)" would fall under the concept of environmental security (Glenn *et al* 1998: 19). Dissent on this definitional component came from some U.S. Army and DHS respondents.

2b. Do you think this is relevant to your mission and operations?

In Question 2b, 90% of the respondents (28 out of 31) thought that the public safety from environmental dangers caused by natural or human processes (due to ignorance, accident, mismanagement, or design) was relevant to their institutional mission and operations. Dissent on the applicability of this definitional component came from some U.S. Army and DHS respondents.

If yes, please explain?

The **U.S. Army respondents'** emphasized three mission relevant areas of focus under this public safety oriented environmental security component. First, there were those who emphasized more traditional prevention / minimization of impacts from current military industrial and operational activities and compliance with environmental management system processes. Second, there was recognition that the DOD and U.S.

Army have a key homeland security / defense mission as well as responding to natural disasters. While defending against manmade disasters, it was well within their mission to bring U.S. competencies and capabilities to the U.S. Government's unified response operations and cooperating with domestic non-governmental organizations (NGOs) and international organizations. Specifically cited was the U.S. Army Corps of Engineers (USACE) front-end planning, preventative infrastructure design, and environmental crisis response roles. Third, there was one organization indicating that focus area included environmental security and understanding its role for "regional stability" and utility as "engagement tool to build regional capacity" (ASR 2008).

Likewise, **U.S. Air Force (USAF) respondents** understood that this public safety environmental security component as mission relevant because of its implications for their operations, particularly in forward operating bases and positions. First, there was a focus on forward infrastructure and logistics relevance, particularly drinking water availability, excessive waste, and its impact on mission readiness. Second, there was very specific mention of the negative influences of natural environment degradation (i.e., desertification) in the form of aircraft Foreign Object Debris (FOB) damage and increased enemy evasion capabilities. Third, there was the acknowledgement that USAF operations themselves also generated a "variety of environmental dangers" (ASR 2008).

The **intelligence community** input suggested that they have a current role in both domestic homeland security response and international humanitarian relief efforts.

Defense-oriented non-profit respondents seemed to have a significant amount of public safety related mission and roles. More globally, some have a direct mission "to

increase awareness of ES problems and solutions" and to evaluate "U.S. response to natural disasters" (ASR 2008). There was also specific mention of responsibilities focusing on climate change mitigation, impact assessment, and adaptation tasks.

This public safety environmental security component resonated with some **homeland security** inputs as it relates to water security. It was suggested that this emphasis would have multiple side benefits even for natural disaster recovery.

Federal environmental professionals stated that public safety is the core of their mandates and missions. While mission relevance was strong, there were diverse focuses presented from monitoring the continued "provision of ecological services" to understanding impact of environmental degradation on the citizenry (ASR 2008). Specifically mentioned were radiological material release incidents and water quality sampling in a disaster recover situation. One respondent commented on the loss of "trust in authorities" and its implications for social instability (ASR 2008). This point emphasized with an example of government water sampling teams literally coming under gunfire during the response to Hurricane Katrina.

A **development-oriented non-profit respondent** affirmed the connection of this environmental security component to their organization's mission. Specifically how their mandate is to "help poor communities around the world secure, sustain and improve their quality of life through the deliver of basic infrastructure projects" (ASR 2008).

3a. Would issues of "natural resource scarcity" be included under environmental security?

In Question 3a, 87% of the respondents (26 out of 30) agreed "natural resource scarcity" would fall under the concept of environmental security (Glenn *et al* 1998: 19). Dissent on this definitional component came from USAF and intelligence community respondents.

3b. Do you think this is relevant to your mission and operations?

In Question 3b, 87% of the respondents (26 out of 30) agreed that the natural resource scarcity component of environmental security was relevant to their mission and operations. Dissent on the applicability of this definitional component came from some homeland security, intelligence, and environmental community respondents.

If yes, please explain?

U.S. Army respondents seemed to generally agree that natural resource scarcity is a mission relevant environmental security component. First, they stated that natural resource scarcity is a concern currently being monitored though sometimes beyond the scope of some defense missions. Second, domestic natural resources and the infrastructure to manage them were directly cited as part of USACE's mission responsibilities. Third, there was also an assertion that energy and materials are needed to support the manufacturing of necessary equipment and material. In the same vein, there was a concern about maintaining access to land and effectively managing quality natural resources (i.e., endangered species restrictions) because of the potential for impacts on the U.S. Army's ability for operational range training. Fourth, there was a

strategic assertion that natural resources considerations will be a larger factor in future conflicts than has historically been the case, and this is mission relevant because the U.S. Army would likely be called in to "assist or stop violence" in such cases (ASR 2008). There was also a reference to the linkage between degraded natural resources (e.g., water scarcity, deforestation, and loss of biodiversity and arable land), the subtle emergence of human insecurity, and the resultant societal fractures / conflicts. In this context, one respondent specifically cited the deteriorated conflict situation in the Darfur region of Sudan, which has required international intervention. Fifth, this natural resource scarcity driver was expected to multiply because of climate change implications for water scarcity.

The **USAF comments** suggested a diversity of perspectives on the mission importance of natural resource scarcity. As with the U.S. Army, there was an acknowledgement that the USAF "consumes, protects, exploits, and degrades natural resources" and that "scarcity is a critical aspect of our national defense" (ASR 2008). Conversely, others commented that scarcity isn't significant or is just a cost issue because direct military needs can be met through the "Defense Production Act" and other "waivers" to environmental regulations (ASR 2008). Some suggested that scarcity would impact their ability to perform mission, particularly citing the example of potable water limitations at forward operating environments or even with support operations. Again, the natural resource scarcity was identified as a root factor in future conflicts.

Likewise, the responses from **defense-oriented non-profit professionals** confirmed the concern and work on water and energy resource scarcity and their linkages

to stability and security. One respondent stated that the study of this environmental security component was a primary focus of their research and work.

The **federal environmental professionals** strongly affirmed the relevance of natural resource scarcity to their missions, research, and activities. They referenced the connections between natural resource (e.g., water, land, food, and fuel) scarcity and the emergence of intense competition, social breakdown, and conflict. A specifically mentioned example was ethnic conflict in Rwanda and its root relationship to land shortages. Also discussed were the potential implications for conflicts that compromise the control of radiological and hazardous materials. The same respondent also cited assistance with this and issues of sustainability as specific mission activities.

Development-oriented non-profit respondents indicated that their mission consisted of helping communities in developing world "make more efficient use of scarce resources or make use of substitutes" (ASR 2008).

4a. Would the "maintenance of a healthy environment" be included under environmental security?

In Question 4a, 97% of the respondents (29 out of 30) agreed "maintenance of a healthy environment" would fall under the concept of environmental security (Glenn *et al* 1998: 19). Dissent on this definitional component came from an intelligence community respondent.

4b. Do you think this is relevant to your mission and operations?

In Question 4b, 87% of the respondents (26 out of 30) agreed that the maintenance of a healthy environment part of environmental security was relevant to

their mission and operations. Dissent on this definitional components relevance came from some U.S. Army, DHS, and intelligence community respondents.

If yes, please explain?

The **U.S. Army respondents** seemed to agree that maintaining a healthy environment was relevant to their mission and operations. First, at a domestic level, respondents seemed to take pride in the progress made by the DOD and their service branches in environmental cleanup (i.e., contamination, unexploded ordinance, etc.), restoration, and protection of natural resources (i.e., endangered species, habitat, etc.) at many of their installations. In particular, USACE's mission for water and environmental management was linked directly to environmental security. Second, comments specifically focused on the importance of maintaining a healthy environment for both military and civilian personnel with some directly stating that it is "paramount to ensuring the viability of the military mission" (ASR 2008). This concept was extended from domestic installations to forward deployed environments and emphasized the commander's prime responsibility for their soldiers' health. In addition to monitoring, respondents emphasized the importance of minimizing adverse impacts on local populations to contribute better local support and post-conflict reconstruction. Their comments specifically cited the need for further research on the environmental health implications of local air quality issues (i.e., expanded Chinese coal fired electric generation) and global climate changes in regard to security issues.

In general, the **USAF respondents** also agreed on the national security relevance of a healthy environment for their missions and operations. Responses suggested that

environmental management that enables a healthy environment was key to "both support" and "sustain operations" (ASR 2008). There were specific forward deployed examples provide where U.S. military personnel were faced with unhealthy environmental conditions from heavy metal contaminated air in Bosnia and radiologically contaminated water in other former Eastern Bloc locations. The take away message provided was that human security is not possible address without maintaining a healthy environment.

Likewise, the comments submitted by **defense-oriented non-profit professionals** mirrored those of the U.S. Army and USAF. In addition to reinforcing previous inputs, the comments provided suggested that maintaining viable ecosystems and environment were critical to ensuring human health and economic development missions.

While first acknowledging the primary importance of public health, **homeland security community** comments stated that "protecting or restoring the environment is a key [homeland] security mission" (ASR 2008). One cited example was the environmental challenge from chemical, biological, or radiological contaminants in run-off following a terrorist incident.

Federal environmental respondents emphasized that environmental agencies, such as EPA, have an explicit mandate "to protect human health and the environment" (ASR 2008). One stated that the mission is a key driver for their work in the sustainability field. They also asserted that a "healthy environment provides the basis for meeting the basic human needs of the energy, food, water and shelter, which when

adequately met increase overall security and stability" (ASR 2008). Others emphasized that healthy environments also encompass critical habitat and wildlife resources.

The **development-oriented non-profit** comments also reiterated the necessity of a healthy environment and its role in successful human communities. An example provided specifically cited the negative healthy impacts of contaminated water resources in a community.

5a. Would issues of "environmental degradation" be included under environmental security?

In Question 5a, 100% of the respondents (30 out of 30) agreed "environmental degradation" would fall under the concept of environmental security (Glenn *et al* 1998: 19).

5b. Do you think this is relevant to your mission and operations?

In Question 5b, 90% of the respondents (29 out of 31) agreed that the environmental degradation component of environmental security was relevant to their mission and operations. Dissent on the relevance of this definitional component came from some U.S. Army, DHS, and defense non-profit respondents.

If yes, please explain?

While one **U.S. Army commenter** suggested that foreign environmental degradation was more of civilian defense responsibility, others respondents did not seem to share that perspective. The comments generally indicated that both domestic and international environmental degradation had mission implications. First, there were

several comments that focused on domestic environmental degradation and its relation to military activities, particularly in regards to regulatory compliance and restoration processes. Second, respondents suggested that such degradation threatened societal quality-of-life and, as a result, negatively impacts "social and economic stability," which in turn impacts their mission (ASR 2008). From this more national perspective, it was also stated that "maintaining our water quality is critical for our national independence" (ASR 2008). Third, one detailed input indicated that a lack of natural resource management in developing countries in both Africa and South America were resulting is significant environmental degradation (i.e., deforestation, mining impacts), which generated "negative second and third level effects on the [local] populations" (ASR 2008). Fourth, in these already vulnerable and unstable regions (and others), climate change is anticipated to act as a "threat multiplier" that will likely result in additional environmental stressors (e.g., drought, natural hazards, etc.) and require increased U.S. intervention and humanitarian support into the future (ASR 2008).

The **USAF respondents** agreed that environmental degradation is pertinent to mission because it reduces their capacity to train and, ultimately, fight, which would impact U.S. national security. Their comments indicated particular concern about training land / ecosystem degradation (i.e., erosion, contamination, etc.), environmental liabilities, and human health threats. More globally, they also suggested that environmental degradation could contribute to insecurity and conflict.

Intelligence community comments stated that its operations contribute remote sensing capabilities that can help manage and reduce environmental degradation.

Specifically noted were the "Landsat landcover mosaics" that are used for "global environmental modeling and assessments" (ASR 2008).

As in previous questions, **defense-oriented non-profit professionals** mirrored those of the other defense perspectives. They suggested that "a degraded natural environment complicates military operations" (ASR 2008).

DHS professionals indicated that environmental degradation would only relate to their mission if it were as a result of an attack or national security incident.

Not surprisingly, all of the **federal environmental professionals** indicated that that environmental degradation was either directly or indirectly relevant to their mandates and missions. One respondent stated that:

> *Whereas a healthy environment leads to a healthy society, a degraded environment leads to a breakdown of society, which leads to political and civil unrest, and possibly war. Climate change will initially bring about environmental degradation in areas that are already marginalized, and have the least capacity to tolerate additional loss of resources, for example sub-Sahara Africa.*
>
> (ASR 2008)

Others commented that their agencies' were active both domestically and internationally to help avoid or limit environmental degradation to better increase human quality-of-life. EPA's capabilities were specifically cited and that their primary purpose is "to stop, prevent or remediate" environmental damage (ASR 2008).

Along the same lines, **development-oriented non-profit respondents** said that they engage communities to help "reverse environmental degradation" (ASR 2008).

6a. Would the "prevention of social disorder and conflict (promotion of social stability)" be included under environmental security?

In Question 6a, 70% of the respondents (21 out of 30) agreed that the "prevention of social disorder and conflict (promotion of social stability)" would fall under the concept of environmental security (Glenn *et al* 1998: 19). Dissent on this definitional component came from respondents across all groups except for the environmental and non-profit development communities.

6b. Do you think this is relevant to your mission and operations?

In Question 6b, only 60% of the respondents (18 out of 30) agreed that the prevention of social disorder and conflict (promotion of social stability) part of environmental security is relevant to their mission and operations. Dissent on this definitional component came from respondents across all groups except for the non-profit development community.

If yes, please explain?

One **U.S. Army respondent** stated "[t]hat [the prevention of social disorder and conflict] is a State Department role and responsibility in the [U.S.] Federal Government" (ASR 2008). However, based upon the other comments, this perspective was not a widely shared sentiment among the group. There was repeated discussion about the new mandate and implications of DODD 3000.05, particularly how it has now put "increased emphasis on the social and cultural aspects of military operation" (ASR 2008). Others noted "social disorder is a growing military concern, because disordered societies can become hosts to terrorist groups" (ASR 2008). While DODD 3000.5 is a significant nod

toward human security paradigm, respondents noted the conspicuous absence of environmental considerations despite that they are generally recognized contributing factor to instability and conflict. They noted that both climate change impacts and natural resource mismanagement could contribute to "social disorder and conflict" in countries or regions (ASR 2008). Of the latter, Congo was offered as an current day example of conflict that can be exacerbated by natural resource wealth, rather than scarcity, of hardwoods and precious metals, and how parties fighting for control have generated instability, social upheaval, and conflict.

Some **USAF participants** suggested that it would only be applicable to mission if the related to U.S. national security and/or to the extent the instability was influenced by natural resource issues and environmental factors. One respondent commented that it is "absolutely" applicable to mission and provided specific examples of USAF rescue and logistics support missions during Katrina and Rita hurricane disasters as well as others throughout U.S. history (ASR 2008). It was suggested that natural hazards / environmental crises are a major USAF mission concern and that these situations can "lead to social disorder and conflict," which requires a response to restore order (i.e., deployment of the National Guard) (ASR 2008).

Defense-oriented non-profit respondents generally agreed that preventing social disorder and conflict are significant to U.S. national security policy / strategy and an ultimate goal of environmental security. One example cited water resource issues and how the prevention of critical shortages could avoid mass migrations and conflict.

However, there were also some that caveated this assertion stating that prevention assumes that its causes were environmental.

Homeland security participants stated that their research activities focus on "crisis communication to inform the media, public, and others during incidents and encourage proper precautions and response actions" (ASR 2008).

Likewise, some **federal environmental professionals** indicated that they only respond to disasters and are "not involved in the prevention of social disorder" (ASR 2008). However, many of their colleagues expressed a broader perspective in that their mission activities are key to educate and inform stakeholders to avoid conflicts. They specifically mentioned that their mission and capabilities help "people to understand and accept the environmental issues and limitations," which can help preclude water right and land conflicts (i.e., violent, legal, or otherwise) (ASR 2008).

Development-oriented non-profit comments suggested that their efforts help "promote social stability through the delivery of civil & environmental engineering projects that build essential infrastructure (e.g., water supplies and distribution, sanitation, energy, bridges, buildings)" (ASR 2008).

7. Are there other topics or areas of environmental security that are missing in Questions #2-6 that are relevant to your work or mission?

In Question 7, 54% of the respondents (15 out of 28) indicated that there were additional environmental security topics or areas that were relevant to their mission or work.

If yes, what are these topics, and how are they relevant?

The **U.S. Army respondents** proposed that environmental security topics are key part of peacekeeping or SSTR operations, particularly in the context of natural resource management and climate change implications (DOD 2005: 1). Another proposed environmental security definitional component or topic was that of natural hazard and man-made emergency response considerations.

Several **USAF professionals** emphasized a need for environmental security to explicitly include encroachment, energy, and climate change components, which could be covered under overall sustainability. Closer to home, the emphasis on encroachment related to the interactions / tensions between growing neighboring communities and military installations, which can have mission impacts. More than one respondent cited "environmental change," and its potential health impacts (i.e., disease casualties) on USAF personnel and, ultimately, mission capabilities (ASR 2008).

Intelligence community inputs proposed a greater focus on and definition of energy security within the environmental security concept. It was suggested that there could be better definition of energy / environment security topic overlap, such as military-related air pollution, oil spills, etc.

Likewise, the **defense-oriented non-profit respondents** proposed and focused in on energy security and climate change components of environmental security. Adding to this, one respondent suggested proposed that environmental security should consider natural resource supply and demand balances. This approach would not only look at

local versus global supply issues but also a technological focus on how to proactively "reduce demand/increase supply in sensitive areas" (ASR 2008).

The **homeland security perspective's** inputs suggested that natural and manmade disaster recovery and restoration would be a topic to include and are already part of their research efforts.

Federal environmental professionals emphasized the importance of habitat and ecological service protection, management, and education under the auspices of environmental security. Also proposed was the monitoring of these aspects as an indicator of "environmental health" and insecurity precursors (ASR 2008).

The **development-oriented non-profit respondents** indicated that environmental security could reinforce the connection with economic market development for community "goods and services," which results in greater reinvestment into the community's environmental resources and infrastructure (ASR 2008). These particular comments emphasize the overall place of environmental security within the concept of sustainability.

8. What is your understanding of the relationship between environmental security and sustainability?

All of the **U.S. Army comments** indicated that there are very strong linkages and emphasized the mutual dependencies between environmental security and sustainability. They commented that "[s]ustainability promotes environmental security" and "effective management of ES is a major element of sustainability and stability" (ASR 2008). Many participants also emphasized sustainability's contribution to stability and resiliency issues

by proactively minimizing environmental degradation and natural resource loss. One respondent commented that "[i]f a country is not living and growing with sustainable realities, there will be conflicts" (ASR 2008).

Likewise, **USAF responses** strongly resonated with those of their U.S. Army colleagues. They stated that "[t]he two concepts cannot be separated" and that "Sustainability ensures Environmental Security for those nations that practice it" (ASR 2008). One comment clearly suggested that "[e]nvironmental security is a major subset of sustainability along with social equity and ecological economics" (ASR 2008). A further comment concisely described the importance of sustainability in that:

> *An important premise of environmental security is that we must protect our resources and environmental assets to secure their use for the future. If we fail to protect them, the world will experience an overall loss of quality of life and increases in strife. The strife will cause war, famine, further environmental destruction and acceleration of unsustainable use of resources.*
>
> (ASR 2008)

Overall, the DOD respondents strongly affirmed the connection between their understanding of sustainability and environmental security. These assertions also seem to pose the question as to: whether the *human security paradigm* is analogous to *sustainability*?

The **defense-oriented non-profit respondents** also echoed their government counterparts in that sustainability and environmental security are two sides of the same coin and were viewed as mutually supportive concepts. They stated that "sustainable practices in a range of areas can improve environmental security" while "[u]nsustainable practices are [conversely] detrimental to environmental security" (ASR 2008).

Furthermore, one commented that "[e]nvironmental security focuses on human impact while sustainability seeks balance" (ASR 2008). There was also recognition that sustainability is a somewhat broader concept and environmental security is a supportive component. Along those lines, one respondent stated that:

> *Obtaining sustainability would provide environmental security, but not necessarily the other way around. I view sustainability as a world-wide goal where individuals' efforts are part of a larger whole, while environmental security can apply to regions or even individuals.*
>
> (ASR 2008)

The **homeland security perspectives** focused on the similarity between sustainability and environmental security as they both emphasize the protection, sustainment, response, and recovery of environmental services (i.e., water, etc.). Sustainable natural resources were cited as "essential for environmental security" (ASR 2008). Conversely, one respondent said that sustainability of environmental services also includes ecosystem services (e.g., wetlands as filters), which are not "related to security" (ASR 2008).

Federal environmental professionals agreed with the aforementioned linkages and mutual dependency between sustainability and environmental security. One respondent provided the example of unsustainable fishery management, fishery collapse, and its impact on livelihoods and systemic vulnerabilities.

Likewise, the **development-oriented non-profit comments** suggested that unsustainable development and economic growth risks natural resources and carrying capacity. This could result in diminished environmental "productive capacity" and "quality of life," which generates "strife and conflicts" (ASR 2008). It was stated that:

> *Sustainability is in terms of low environmental impact development. Environmental security is more to do with a stable, unstressed, environment within which human communities function and do not come into conflict for resources.*
>
> (ASR 2008)

9. Does your Agency / Organization actively consider any of these topics as they relate to your mission and operations?

In Question 9, 80% of the respondents (24 out of 30) indicated that their Agency / Organization actively considers environmental security and/or sustainability issues in relation to their mission and operations.

10. Does your Agency / Organization have any environmental security mission or operational responsibilities?

In Question 10, only 67% of the respondents (20 out of 30) indicated that their Agency / Organization had any environmental security related mission and operational responsibilities.

If yes, what are they?

U.S. Army respondents suggested that their service branch had direct environmental security responsibilities that include SSTR, counter-insurgency engagement, emergency response, and humanitarian aid. One commented that there is "growing recognition by LTG Vaugh and Chiarelli that it's all part of engaging insurgencies in varying degrees of conflict" (ASR 2008). Other participants commented on responsibilities such as sustainability policy research as well as the more conventional prevention, mitigation, and cleanup of environmental damage from its operations. Furthermore, USACE's natural resource and infrastructure missions were referenced, and

so far, that one respondent suggested that "environmental security [is] native" to its mission (ASR 2008).

The comments of **USAF participants** indicated that they thought environmental security was "part of our core mission," but they specifically focused on topics, such as drinking water security, pollution, training ranges, and BRAC issues (ASR 2008).

Intelligence community responses identified disaster and humanitarian relief analysis and support operations as relevant environmental security responsibilities.

Defense-oriented non-profit comments indicated that they were responsible for providing environmental security updates on new developments to appropriate personnel.

Federal homeland security and environmental respondents agreed that the U.S. EPA has the lead on protecting source water and distribution infrastructure. As such, promoting water security is a key goal for the U.S. EPA and its Homeland Security Research Center, particularly in assisting public water systems with vulnerability assessments, emergency response training, and contaminant monitoring. It was also suggested that U.S. EPA contributes to the Interagency Task Force on radioactive material security and safety as well as other roles supporting the security of U.S. environmental resources. USGS respondents suggested their Agency has environmental security responsibilities related to water science, natural disasters, and zoonotic disease transmission issues.

11. Does your Agency / Organization have an official definition of environmental security?

In Question 11, only 11% of the respondents (3 out of 28) stated that their Agency / Organization had an official definition of environmental security. Of these, the U.S. Army War College, U.S. Military Academy, and The Millennium Project – WFUNA were the only Agencies / Organizations identified that may potentially have an official definition of environmental security.

If yes, how is it defined?

As confirmed by previous research, the DOD previously had official definition per DODD 4715.1 but was rescinded in March 2005. However, **DOD respondents** overwhelmingly were not aware of a current official definition for environmental security within the DOD or their respective service branches (i.e., U.S. Army or USAF). There was mention that U.S. Army War College and U.S. Military Academy may have official definitions.

One of the **nonprofit-defense respondents** stated that the United National Millennium Project has an official definition for ES as stated previously in this chapter.

Like DOD, respondents from both the **intelligence** and **homeland security** communities were not aware of or able to identify an official definition of environmental security. One DHS respondent suggested that U.S. EPA might have an official definition. However, **federal environmental professionals** were not aware of such a definition for U.S. EPA or any other agencies.

12. Do you think that current national and homeland security policies and strategies adequately support the use environmental security or related issues to help meet mission goals within your Agency / Organization?

In Question 12, only 21% of the respondents (6 out of 29) thought that national and homeland security polices and strategies adequately support the use environmental security or related issues to help meet mission goals within their Agency / Organization.

If not, please explain why?

U.S. Army respondents suggested that the prior NSS addressed environmental security though with a limited emphasis on energy security and climate change in the context of "economic progress" (ASR 2008). However, some felt that the environmental security mandate has "lost ground" since 2001 because of the current GWOT focus on "kinetic actions rather than preventative ES policies" (ASR 2008). Several respondents indicated that current NSS mandate for GWOT doesn't promote efforts to proactively mitigate issues that contribute to "unrest, instability, and potentially insurgency" (ASR 2008). Despite this, it was felt that a paradigm shift is already underway and reflected in new environmental security complementary mandates, such as NSPD-44, DODD 3000.5, and the Army Field Manual on Insurgencies. It was also suggested that a new environmental security policy mandate could help improve "environmental performance" (e.g. reducing energy consumption, HAZMAT use, etc.) and more quickly realize "real sustainability" (ASR 2008). One comment went as far as to propose that environmental security concept is a more useful mission term while "sustainability…seems a separate requirement" (ASR 2008).

Some **USAF participants** commented that there is a lack of statutory and executive mandates for environmental security so there is, as a result, no cohesive framework to develop proactive policy, procedures, etc. As such, "[e]nvironmental security is not a mission of DOD but merely a necessary element to support its overall mission to train for and win in military engagements" because [w]ar time demands are top priority" (ASR 2008). They also felt that DOD and USAF missions were not oriented on environmental security because they are limited to only the regulatory compliance efforts necessary to maintain operations. As a result, environmental impacts are sometimes not considered in institutional planning and decisions.

Likewise, **defense-oriented non-profit respondents** commented that "[t]here doesn't seem to be any notion of environmental security…in the U.S. government today" (ASR 2008). Others felt that environment-related issues (security or otherwise) are "low…on the list of national priorities" and, as such, are not provided with sufficient resources, which is "short-sighted" (ASR 2008). Some directly lamented that an environmental security policy is not sufficiently elaborated in the NSS or NMS. This in turn does not mandate the development of an adequate framework or subsequently enable resource allocation, policy analysis, and real world implementation.

One **homeland security respondent** rather directly stated that "DHS has very little regard for environmental issues" (ASR 2008). Another commented that current DHS policy overly emphasizes on sectors with previously identified vulnerabilities, such as aviation, mass transit, etc. The implication was that they are focusing effort and

resources on yesterday's vulnerabilities rather than proactively mitigating tomorrow's big risks.

Despite this contrary funding emphasis, **federal environmental professionals** suggested that their agencies (e.g., EPA) have further developed their response roles and capabilities for both manmade (e.g., 9/11 attacks and anthrax contamination events) and natural disasters (Katrina, Rita, etc.). However, some respondents suggested that there still is a focus on "command & control" mentality so more proactive collaboration and communication continue to suffer (ASR 2008). With this, there are insufficient public outreach and awareness initiatives that can help better address public concerns.

Development-oriented non-profit participants commented that U.S. national and homeland security policies have too much domestic focus and have the effect of isolating the U.S. abroad. This emphasis forecloses opportunities for engagement, particularly in developing countries where development organizations work most closely.

13. How could a national environmental security policy mandate help your Agency / Organization better meet its mission, operational, and functional needs?

While some **U.S. Army respondents** indicated that they just do the mission assigned by the President, many suggested that a U.S. environmental security policy mandate would be embraced and helpful in several aspects. First, it would provide "top cover," visibility, and strategic direction, with top leadership (e.g., Combatant Commanders) (ASR 2008). Second, an environmental security mandate would also better encourage proactive communication, awareness, and planning for future mission readiness, including OCONUS expeditionary forces. Third, it would help make or

reinforce the connection between environment and mission for warfighters while concurrently emphasizing the mission focus environmental support professionals. Fourth, such a mandate would help enable better interagency coordination and partnering. Finally, one respondent though that such a policy mandate could "inspire everyone to [proactively] make the necessary sacrifices now, instead of reacting to future catastrophes" (ASR 2008).

With some dissent, **USAF respondents** generally agreed that a policy mandate would be welcomed and useful by creating a national environmental security "vision, mission, and objectives" (ASR 2008). It would also require decision-makers to take a longer-term perspective and obligate the necessary resources to meet environmental security related mission needs. It was thought that "aggressively pursued" and consistent environmental security efforts could prevent or at least mitigate future conflicts (ASR 2008). Others suggested that an environmental security mandate would help "improve OCONUS environmental activities" because it would help synchronize with the current high standards observed in CONUS activities (ASR 2008).

Likewise, an **intelligence community** response suggested that such a mandate would help "[i]dentify areas of interest so that appropriate resources can be applied" (ASR 2008).

The **defense-oriented non-profit** comments were supportive of an environmental security policy mandate. They specifically emphasizing the broad based and positive cooperation and coordination it would engender. Some commented on the integrated and long-term perspective change this would support among top-level leadership. They also

emphasized that it would ensure that "resource-dependency resilience" be "incorporated…into our operational plans" and minimize "resource depletion" (ASR 2008).

A **homeland security contributor** suggested that the provision of natural resources (e.g., water, food, etc.) is one critical element of crisis management and could assist with disaster recovery and resilience goals. Another commented that U.S. EPA, as a homeland security partner, already includes an environmental security mission so a mandate would not impact their activities either positively or negatively.

Federal environmental professionals indicated that they already had a sufficient environmental security mandate. For example, one commented that "EPA has adopted a mandate for national environmental security that is not articulated as such, but exists to protect the environment and reduce damage to environmental resources when an incident occurs" (ASR 2008). However, several respondents expressed concern over the risk of mission and funding resource encroachment by the military if an environmental security mandate were adopted. One respondent stated that: "The concept is excellent. The reality is scary" (ASR 2008).

One **development-oriented non-profit respondent** thought that a national environmental security mandate would provide more recognition for their development efforts with communities. A clear connect was expressed between "improving quality of life, but improving the environmental security of the communities we assist" (ASR 2008).

14. Does your Agency / Organization have any environmental security capabilities to support mission or operational needs?

In Question 14, 90% of the respondents (27 out of 30) indicated their Agency / Organization did have environmental security capabilities to support their mission or operational needs. Respondents from DHS and defense-oriented non-profit organization suggested that they did not have such capabilities available in their Agency / Organization.

If yes and unclassified, what are they? If so, please explain how?

Many **U.S. Army participants** identified environmental security capabilities resident within their institutions. First, they suggested a robust capability for environmental security and sustainability policy and operations research across a broad spectrum of activities, which could be leveraged to develop "proactive policies and strategies" (ASR 2008). Second, others commented on the resident expertise and sponsored research on energy, climate change, health, sustainability, and environmental security issues. Third, it was noted that the U.S. Army's expertise on national security issues are "uniquely qualified subject matter experts" that have already "aided major US commands in the area of ES" (ASR 2008). One respondent noted the broad experience that Army National Guard units bring from their civilian occupations. Fourth, others specifically identified USACE's depth and breath of environmental engineering, construction, and monitoring capabilities as well as their disaster mitigation and emergency response expertise. Despite this, it was noted that more research is necessary to really understand the "linkages between environmental challenges and security

challenges" (ASR 2008). One further participant commented that additional capabilities exist but are "For Official Use Only (FOUO)" restricted (ASR 2008).

The **USAF respondents** suggested that their service branch also had significant environmental security related capabilities to contribute. First, some emphasized a comprehensive policy framework and technical capacity to support pollution prevention (P2), compliance, and clean-up operations. Though, one participant noted that this applied more for installations than expeditionary force deployments. Second, others identified significant capabilities for conservation and natural resource management, particularly at defense installation level. Finally, another respondent identified well-trained emergency and HAZMAT response personnel that are available for environmental security missions, particularly to ensure that USAF installations "meet [their] environmental requirements" (ASR 2008).

Intelligence community comments specifically identified their proven expertise and technical assets to support disaster and humanitarian relief analysis needs.

One **defense-oriented non-profit participant** stated that the DOD could achieve any mission it is given. That said, others suggested that they had the capabilities to help support environmental security mandates and missions with expertise and analysis on energy, climate, and related emerging issues, as needed.

The **homeland security respondents** identified water security research funding and capabilities (i.e., monitoring, response, recovery). They specifically mentioned their partnership with the U.S. EPA, Office of Research and Development, National Homeland Security Research Center and Office of Water, Water Security Division.

Some **federal environmental professionals** indicated availability of wide range of science, decision-making, and field support capabilities in areas such as: geology, geography, water and air resources, biology, wildlife, agriculture, hazardous materials and waste. They also mentioned the creation of regional water security teams as well as emergency response teams.

Development-oriented non-profits suggested that their student and professional networks host significant capabilities, which are resident in associated universities and corporations.

15. Does your Agency / Organization have any environmental security capability gaps or needs that you are aware of?

In Question 15, 67% of the respondents (16 out of 24) indicated that their Agency / Organization had environmental security gaps or needs. However, some U.S. Army, USAF, federal environmental and intelligence community responses commented that they did not have capability gaps within their Agency / Organization.

If yes and unclassified, what are they and are there examples of negative impacts to mission or operations?

Some **U.S. Army comments** specifically cited the need for "metrics & linkage between environmental threats and vulnerabilities and conflict and stability" (ASR 2008). It was also suggested that currently datasets and metrics are insufficient to really understand political / institutional, economic, and socio-cultural stability / status, and that this had negatively impacted DOD's SSTR operations. One respondent stated that: "[t]he Army is structured and equipped to win the last war. They must become more adept and

flexible to meet the threats of a counterinsurgency" (ASR 2008). Along these lines, others stated the need for improved "cross-national and cross-agency understanding, policies, and procedures for proactive international ES missions" (ASR 2008). Again, a participant commented that capabilities gaps exist but are "FOUO" (ASR 2008).

The **USAF responses** suggested that OCONUS forward bases' and operations' ESOH capabilities not comparable with CONUS (i.e., air, waste, hazmat, etc.). One participant specifically commented on the current solid and hazardous waste disposal challenges / needs at forward operating bases, and how this issue (i.e., open pit burning) is contributing to air pollution, human health, and environmental impacts. Others indicated a lack of dialog / education about environmental security challenges, particularly as they pertain to military missions.

Defense-oriented non-profit respondents focused on the need to incorporate environmental security into defense culture. They did, however, assert that energy security efforts are already starting this process. Some cited DOD's minimal planning and implementation efforts for response and environmental impact reduction, which were closely connected with funding resource limitations. One example provided was the need to better understand military implications of extreme weather trends on backup power requirements.

A **DHS respondents** suggested need for additional research and funding for activity in this area.

Federal environmental professionals specified needs for several different environmental security capabilities. First, they cited the need for increased laboratory

capacity for radiological sample processing and analysis sufficient to handle requirements following disasters. Second, others felt that environmental response personnel are insufficient and strained during disaster, specifically citing the situation during 9/11. Associated with this, one respondent indicated that the U.S. EPA responsible for the long-term recovery following an incident, and this requires multiple field response teams, on-site personnel, and support. However, there are currently insufficient resources allocated to maintain adequate response teams. Another stated that environmental security "linkages to decision-makers may not be as clear and strong as they should be" (ASR 2008).

The **development-oriented non-profit respondents** indicated that they currently had not incorporated environmental security considerations into their efforts. They were also not aware of any negative impacts.

16. Would you be interested in participating in a one-day workshop to be held in Fall 2008?

In Question 16, 73% of the respondents (22 out of 30) indicated that they would be interested in participating in the follow up one-day workshop to be held in September 2008.

17. Would you like to receive an electronic copy of the project's final report?

In Question 17, 100% of the respondents (27 out of 27) indicated that they would be interested in receiving an electronic copy of this project's final report.

Based upon the results of Questions 16 & 17, it is clear that the respondents were indeed interested in learning more about the environmental security concept and its

implications for U.S. national and homeland security. Not only were a large majority potentially interested in attending the later workshop, but all respondents wanted to receive a copy of the project's final report. This interest was later to be further confirmed by the workshop attendees as discussed in Chapter 6.

Survey Findings Summary:

Taken together, what do these survey results suggest? Overall, the survey responses indicate a wide variety of perspectives and understanding of environmental security. First, the U.S. Army respondents stress linkages between natural resources and national security, including stability issues. Second, the USAF responses focus on the defense and sustainment of critical environmental resources. Third, intelligence community comments affirm that environmental factors do "influence national security interests" (ASR 2008). Fourth, homeland security respondents emphasize protection of key environmental resources / infrastructure and their importance for self-sufficiency during disaster. Finally, federal environmental professionals stress the importance of ecological services / resources to citizens and their health.

The survey also helped to determine whether these groups agree or disagree with the environmental security definitional components presented in Glenn *et al.* and relevance to their respective missions (1998). Those five definitional components are:

1) *Public safety from environmental dangers*
2) *Natural resource scarcity*
3) *Maintenance of a healthy environment*
4) *Environmental degradation*
5) *Prevention of social disorder and conflict*

(Glenn *et al*. 1998: 19)

Of those components, there is widespread agreement among those surveyed that all the definitional components but the prevention of social disorder and conflict (No. 5) would be included under environmental security and relevant to their respect U.S. Government institutions' missions or operations. While there is less agreement over the No. 5, many respondents still thought that it was part of environmental security and represented a proactive and relevant part of their respective mission. Those that thought this component was relevant specifically referenced new policy mandates, such as NPSD-44 and DODD 3000.5. However, they noted that these mandates also lacked a clear environmental component.

In addition to agreeing with these definitional components, over half of the survey respondents also proposed other environmental security topics of significance. Specifically proposed were:

- Energy Security
    - Environmental cross-over
      (i.e., air pollution, hazmat management and spills, etc.)
- Climate change
    - SSTR, mission capabilities impacts, and human health implications
- Natural hazard and manmade emergency response
- Natural resource management
- Encroachment

Survey responses also indicate a general agreement on the very strong linkage between sustainability and environmental security. They emphasized a mutual dependency between these concepts and how the concept is part of overall sustainability.

Many respondents stated that they though sustainability contributed to human security, social stability, and community resiliency issues. Some comments indicated that environmental security is a useful term for integrating environmental factors into mission planning and operations. These also beg the question of whether sustainability is the integrative basis for the broader human security paradigm.

Most participants indicated that their institution considers environmental security and sustainability, but a smaller proportion thought that they had any direct responsibilities. The U.S. Army seems to have the broadest responsibilities, including: 1) the maintenance of environmental and water resource; 2) SSTR and counter-insurgency engagement; 3) emergency response and humanitarian aid; and the mitigation / cleanup of environmental damage. The USAF responses cited responsibilities related to "drinking water system" security to "ranges, base closures, and pollution issues" National Security Presidential Directive (ASR 2008). Intelligence indicated responsibilities to support disaster response and humanitarian relief. Homeland security respondents mentioned the protection of drinking water system (i.e., EPA role). Other federal environmental institutions cited responsibilities associated with: 1) public health / wildlife disease prevention; 2) drinking water contaminant prevention and protection, 3) disaster and emergency response; and 4) environmental resource management.

Despite these responsibilities, no official definitions of environmental security are identified or known about within the federal government. Some respondents cited DOD's previous official definition per DODD 4715.1 but noted that it was previously

rescinded in March of 2005. Others suggested that the U.S. Army War College and U.S. Military Academy might have official definitions.

Most national security professionals surveyed thought the current mandate for environmental security was inadequate. Some respondents suggested that the mandate has "lost ground" since 2001 and that the current NSS focus on GWOT does not promote efforts to proactively mitigate issues that contribute to "unrest, instability, and potentially insurgency" (ASR 2008). Others indicated that the lack of a statutory and executive mandate precludes a cohesive framework. Overall, most respondents seemed to think that a new environmental security policy and strategy would be embraced and helpful by:

- Providing "cover" and visibility with top leadership
- Making the mission connection for those working with missions that involves environmental components
- Encouraging proactive communication, awareness, and planning for future mission readiness, including OCONUS operations
- Consistent effort could prevent or mitigate future conflicts
- Enabling better interagency and external partnering
- Requiring obligation of resources to meet mission needs
- Assisting with disaster recovery and resilience goals

However, some environmental professionals thought they had already had a sufficient mandate and were concern over mission / resource encroachment by military entities and interests.

In terms of available capabilities, the survey respondents from all groups identified resources across the spectrum of environmental security issues. Resident

within the U.S. Army are capabilities that included: defense-relevant environmental security and sustainability policy research; energy, climate change, and emerging environmental security issue updates; environmental engineering, construction, and monitoring; and disaster mitigation and emergency response. Though, one respondent mentioned that some capabilities were limited to FOUO and, as such, not open source. Likewise, the USAF mentioned resources for: P2, compliance, clean-up, conservation and natural resource management, and emergency / HAZMAT response. Intelligence comments acknowledged resident resources that support disaster and humanitarian response efforts. DHS respondents specifically identified water security research capabilities, focusing on monitoring, response, and recovery activities. Federal environmental professionals indicated availability of wide range of science, decision-making, and field support capabilities in areas such as geology; geography; water and air resources; biology, wildlife, and agriculture; and hazardous materials and waste.

Conversely, the DOD respondents first and foremost stated need is for the greater awareness and integration of environmental security thought throughout the defense community. Second, there is a gap for the data and metrics to assess environmental, economic, and political status and to monitor their critical linkages to conflict. Also identified are gaps in interagency "understanding, policies, and procedures for proactive international ES missions" and forward operating base ESOH capabilities (ASR 2008). Domestically, federal environmental professionals suggested the need for greater capabilities in radiological sample laboratory analysis capacity, response teams, and environmental recovery personnel.

Based upon these responses, I developed a list of environmental security topics and issues during this analysis for further discussion at the September 18th 2008, workshop. These topics and issues included:

- Sustainability
- Human Security
- Energy Security (local, regional, and global)
- Climate Change (threat multipliers)
- Water Resources (quantity and quality)
- Food Security
- Land-use
- Encroachment
- Hazardous materials, contaminants, and UXO
- Solid and Hazardous Wastes (Basel Convention)
- Soldier and Local Population Health Protection
- Natural Resource Management and Restoration
- Natural Hazard Prevention, Mitigation and Response

Overall, these survey findings were a key resource in preparing for the later September 18th, 2008 workshop at GMU. They provided the requisite knowledge to develop the workshop briefing and a basis for the informative exchanges, which is discussed in further detail later in Chapter 6.

CHAPTER 6: ENVIRONMENTAL SECURITY OPERATIONALIZATION AND GAP ASSESSMENT WORKSHOP

For this part of the project, I organized and facilitated an interactive focus group workshop to further identify and refine the participants' understanding of environmental security. Its setup and format were designed to approximate encroachment and sustainability planning efforts currently used within the federal target audience communities. The workshop was developed to:

1) Generate greater familiarity and discussion;
2) Validate, disapprove, and/or augment Task 3 email results; and
3) Identify strategic or operational capability needs and resources in a consensus-oriented environment.

I selected the workshop's interactive format to engender an environment that would develop stakeholder ownership of the results, which would serve the project's action research aims. Prior to the workshop, participants were emailed logistical materials and a preliminary primer article to provide further context for the information identified in the Task 3 survey efforts. This served to help ensure a common level of conceptual and terminology understanding.

This interactive focus group workshop was organized and held at George Mason University's Fairfax Campus on September 18th, 2008 between 8:30am - 4:00pm. Of the earlier survey participants, 24 (75%) expressed interest to participate in this follow up

workshop. Of those, 15 later confirmed their attendance and an additional 8 expressed continued interested but had scheduling conflicts. Ultimately, the workshop engaged 8 U.S. defense, civilian, and non-profit support professionals that had participated in the earlier survey or been referred by those who had participated.

Following the welcome and introductory remarks, the participants who wished to identify themselves and their host institutions were given the opportunity to do so. I presented some logistical information, agenda, and ground rules information. After this brief introduction, I presented the project's process, basic terms, background on environmental security, and initial Task 3 survey results to develop a common background for further discussions.

Briefing Discussions:

During the morning's interactive briefing, the participants actively discussed issues generated through the projects initial research and findings. In particular, several participants offered their perspectives and comments on four specific portions of the presentation. These areas of discussion included: 1) DODD 3000.5; 2) DOD's environmental security activities; 3) utility of an environmental security policy mandate; and 4) opportunities opened by such a mandate.

First, there was significant interest and enthusiasm at the mention of DODD 3000.5 and how it officially brought human security considerations to the forefront defense operations. While it does not directly mention environmental considerations, defense participants emphasized how significant the adoption of DODD 3000.5 is for DOD strategic planning and operations. It represents a major "sea change" in defense

thinking as it now equalized defense mission priority between combat and SSTR (i.e., human security) missions (AWP 2008). This policy directive is significant for DOD strategic planning, operational priorities, and resource allocations. In this context, the discussion of environmental security "threat multipliers" seemed to highly resonate with the participants (AWP 2008).

Second, there was significant interest in the brief compilation presented of DOD Unified Combatant Commands (UCCs) or COCOMs and their respective environmental security interests / activities, whether defined as such or not (Taureck and Dabelko 2006). Despite the institutional reticence to use the term environmental security in recent years, COCOMs' missions and operational necessities have seemed to spur and sustain DOD environmental security-related activities, such as:

- CENTCOM's water, environmental partnership, and engagement activities that also target "soft underbelly" of terrorism (Pumphrey 2008; Butts and Turner 2004: 1).
- SOUTHCOM's disaster response and environmental security military-to-military training engagement activities (Pumphrey 2008).
- PACOM's seismic and tsunami impact response and mitigation efforts (Pumphrey 2008).
- AFRICOM's start up focus on human security and engagement (Beebe 2008a).
- CONUS installation sustainability, domestic disaster resilience, and response support activities (e.g., Katrina, Rita, Gustav, Ike, etc.)(Pumphrey 2008).

Workshop participants also suggested several additional environmental security-related mission focus and activities, such as:

- EUCOM's challenges with the Soviet legacy of environmental degradation and its implications for soldiers' health.
- AFRICOM's interest in natural resource scarcity / wealth and its security implications.
- NORTHCOM's interest in implications of climate change in the Arctic Ocean, particular for new shipping routes and seabed natural resource considerations.

In addition to these activities, I also presented and discussed some drivers and/or factors that seemed to be contributing to renewed interest in environmental security within the U.S. national security community. These were thought to include **energy security** (i.e., EPAct 2005, EISA, and DSB Energy Task Force), rapid emergence of **climate change** (i.e., CNA Report, DOD FY08 Authorization Act - Sec. 951, SSI Climate Change report), and environmental related **forward basing issues** in Iraq and Afghanistan (Beebe 2008b). Discussion on this latter topic was particularly timely considering the RAND Corporation released the AEPI-sponsored study titled "Green Warriors: Army Environmental Considerations for Contingency Operations from Planning Through Post Conflict" just 5-days after the workshop, which focused on environmental considerations in full-spectrum contingency operations (Mosher *et al.* 2008). This report's recommendations highlighted many of the key direct and indirect operational challenges manifesting themselves in the absence of an integrative environmental security mandate.

Third, when presenting survey results on whether an environmental security mandate would be helpful, some participants took issue with the assertion that it may help "make the mission connection for those working with missions that involves environmental components" (AWP 2008). As highlighted by the "Green Warriors"

report, participants suggested that mission personnel in theater did not need to be convinced that environmental considerations posed major challenges and "get it" (AWP 2008). They also indicated that mission personnel needed the DOD environmental support providers to understand the imperative to align with the forward troops' operational needs. Others suggested that that the current organizational structures, cultures, and resource allocations are not adequate to enable the coordinated support necessary despite the acute awareness by soldiers in combat zones. The suggestion was made that there is a gap in the current conception and priority given "soft power" initiatives and that they needed to be viewed more in terms of a "smart power" concept (AWP 2008).

Finally, the workgroup participants expanded on this when discussing initial opportunities that could be enabled by a U.S. environmental security mandate. Based upon survey comments, the briefing suggested that such a mandate could be useful to:

- Provide policy legitimacy and leadership for existing activities developed through operational necessity
- Further enable coordinated development of:
    - Environmental resource or "intelligence" monitoring
    - Engagement, partnering, and development efforts
    - Disaster resiliency and response mechanisms
- Support forward deployed bases environmental security activities
- Post-conflict and counter-insurgency engagement
    - Recovery methods, resources, and activities
    - "Open Source" approach advocated by J. Robb & S. Beebe

There was particular interest the post-conflict and counter-insurgency opportunities and how open source data and technology could be leveraged across defense, diplomatic, and non-profit stakeholders. One participant cited high-level interest by the DNI and their recent Open Source Conference, which was held only a week prior to the workshop. It was also noted that there was significant interest in open source technology and its application to disaster response and monitoring of natural resources.

Security and Environment Brainstorming:

Following this interactive presentation, I led the participants in a group brainstorming session that served to:

1) Identify issues / connections between environment and security;
2) Understand how these connections apply to the participants' missions and operations; and
3) Explore the relevant commonalities across federal institutions.

These brainstorming results were recorded on flipcharts and displayed them in the workshop room.

To build on the group's earlier discussions, the participants were first presented with a list of environment security issues that were identified and compiled from the survey results. These were the issues outlined at the conclusion of Chapter 5. Then, building on the criteria elaborated by King (2000), I suggested that: **All environmental issues are not security issues. All security issues are not environmental issues.** Using this as a starting point, the participants started brainstorming on environment and security issues. The participants agreed that this initial statement was a good start to identifying

environmental security issues. However, they also suggested that security and environment overlap is likely more of a continuum than an either/or situation. The amount of crossover "depends where you sit" (AWP 2008).

This discussion first went on to further define environment and, later, to identify environmental security issues. The workgroup categorized natural resources as renewables and non-renewables. They suggested that either natural resource scarcity or wealth could have security implications, specifically citing Congo as an example of the latter. Natural resources were thought to include:

- Materials and minerals;
- Energy resources;
- Biodiversity wealth and export; and
- Ecosystem services (e.g., Honduras coastal fisheries that provide food)

In this context, participants suggested that the manmade environment and activities could impact these natural resources' viability. Participants cited the example of coastal and marine resource degradation, such as eutrophication and threatened and endangered species losses. One participant observed that there is a mismatch between natural (i.e., geographic) and human (i.e., political) boundaries, which complicate these challenges further. Others cited the challenges inherent in an increasingly dynamic international order and divergent nation-based common interests. During this discussion, contributors cited the potential for environment to be used of a "Tool of War" and new emphasis on negative "second and third tier effects" (AWP 2008).

Conversely, the workgroup also emphasized that environmental security could represent new opportunities for collaboration, citing an example of bilateral cooperation

to preserve coastal biodiversity. They also cited other environmental security issues, such as:

- Training range sustainment
- Energy security
- Climate change impact and mitigations
    - Food security
    - Natural disaster response

In the context of climate change, the participants again suggested the importance of downstream effects (or threat multipliers) in today's security environment. They emphasized the opportunities environmental security could enable to collaboratively build organizational and community resilience to natural hazards. The workgroup also discussed how these types of efforts could contribute to long-term human security and sustainability.

Common Topic Area Workgroup Results:

In the next section, I broke out the participants into small working groups randomly mixed by institution and functionalities. These work groups were provided with the Common Topic Area worksheets and tasked to:

1) Select existing or propose new topic areas / common elements that fall under environmental security;
2) Identify how those new topic areas / common elements apply to national and homeland security missions;
3) Record these findings on prepared templates; and
4) Post these results on a designated wall of the workshop venue.

After finishing their task, the participants did not feel it necessary to vote (with colored stickers) because there was not expressed disagreement on the applicability of on environmental security topic areas / common elements. During the break, the consensus derived environmental security topic areas / common elements were organized and placed predominately in the room. The brief summaries of these results have been included below, broken out by institutional perspective and common topic area.

From a **U.S. Government Cabinet-level policy perspective**, some workgroup participants developed applicability statements for the proposed Common Topic Areas. In relation to the ***public safety from environmental dangers*** topic area, they cited broad relevance for both national and homeland security mandates, particularly as they both relate to protecting American public, their health, and general welfare. Specifically mentioned were air and water pollution as well as avoiding mismanagement of the environment. This also seemed equally applicable and relevant to ***natural resource scarcity*** topic area, and the mission to promote U.S. national interests abroad by engendering broader international stability. To this end, participants cited the NSS's and NPSD-44's mandates for coordinated interagency SSTR roles and natural resource (e.g., water) management support activities.

They also clearly stated that the ***prevention of social disorder and conflict (promotion of social stability)*** was the primary goal of U.S. recent national security policies (as well as those of the United Nations, World Bank, International Monetary Fund, etc.). They emphasized the relevance of this topic area in "[h]elping to stabilize governance in all nations (e.g., extension of the rule of law, social well being, economic

viability) [which] conceptually enables each nation to respond to threats (internal / external, natural causes or human / social causes)" (AWP 2008). To these ends, all U.S. Government agencies are led by the Department of State and the DOD in mission efforts to promote "[l]ong-term international cooperative security & engagement between nations" (AWP 2008). This topic area's homeland security mission analog focuses on the "building [of] institutional capacity are they relate to disaster preparedness & response" (AWP 2008). One participant suggested that gains in this area were demonstrated by much improved interagency responses to hurricanes "Gustav and Ike" as compared to that of "Katrina and Rita" (AWP 2008). However, it was also noted that similar preparations have not yet been made for other "domestic stresses" to U.S. social stability (AWP 2008).

From the **DOD / U.S. Army perspectives**, the ***public safety from environmental dangers*** topic area of environmental security was considered relevant to the participants' national security mission in several ways. Contributors suggested that this common element is important to achieving their direct national defense, preventative defense, humanitarian operations, and force protection missions. They also emphasized the importance of adhering to health and environmental regulations that enable the necessary training, maintaining readiness, and force protection platforms to effectively support the aforementioned missions. DOD's homeland security mission roles requires the National Guard to train and maintain readiness to support operations, such as critical infrastructure protection, border control (i.e., immigration of environmental refugees), and disaster relief operations.

These DOD / U.S. Army contributors also considered ***natural resource scarcity*** relevant to their national security mission. Participants cited NSPD-44's implication that all relevant U.S. government departments and agencies have a responsibility to contribute to national security and stability for all nations, specifically referenced was their role to support water resource management and development. In addition to this broader mission mandate, they also mentioned that natural resources are required to create and support U.S. military weapon systems to ensure battlefield advantage, which is the responsibility of DOD, federal government partners, and industry equipment manufacturers. Likewise, they elaborated a homeland security mission for the National Guard and Reserve role to protect critical infrastructure and the natural resources upon which it depends.

DOD / U.S. Army perspective participants also identified the relevancy of the ***prevention of social disorder and conflict (promotion of social stability)*** environmental security topic area. They felt that this common component directly related to their GWOT and soft power projection missions. It was stated to be particularly applicable to COCOMs and their counter-insurgency mission goals.

The DOD / U.S. Army workgroup also proposed two additional common topic areas, which include: 1) "Force Protection" and 2) "Encroachment / Urbanization / Land Use" (AWP 2008). First, the proposed force protection topic area referred to the "[n]eed to protect the force from environmental threats [during] full spectrum operations (deployments)" as directed by the President (AWP 2008). It was admittedly a DOD specific "variant on [the environmental security] public safety" common element (AWP

2008). Second, proposed Encroachment / Urbanization / Land Use topic area referred to challenges to maintaining adequate training ranges and installations necessary to meet the U.S. Army's goals for training, readiness, and force transformations.

From a **NASA perspective**, the civilian environmental contributor felt that there was national security mission relevance across all of the environmental security common topic areas. First, it was indicated that there was direct mission relevance of ***natural resource scarcity*** topic area because it could represent limitations on the ability to "manufacture space exploration equipment" (AWP 2008). Ultimately, this would impact NASA's human space flight and national access to space missions. Likewise, this contributor suggested that both the ***maintenance of a healthy environment*** and ***environmental degradation*** topic areas are also relevant because they relate to mission support capabilities and could indirect represent "assess to space" limitations. The NASA perspective seemed analogous to other civilian agencies in relation to the applicability of the ***public safety from environmental dangers*** common element because of their supportive role under the National Response Plan (NRP), particularly in areas of providing remote sensing data and analysis. The contributor also indicated that the ***prevention of social disorder and conflict (promotion of social stability)*** is a relevant common topic area because of is emergency response support role under the NRP. Also mentioned was the broader direct relevance for Earth Science, remote sensing data, and decision support tool development missions.

Institutional Workgroups Results:

In the next session, I organized new working groups by like institutional areas, which included participant groups from the U.S. Army, NASA, and non-profits (defense support) attendees. These new institutional workgroups were provided with the Topic Area Applicability, Issues, and POCs worksheet packet and tasked them to:

1) Identify the environmental security topic areas that apply to their institutions;
2) Identify specific environmental-defense issues that fall under each relevant environmental security topic areas;
3) Record these results on form packets provided; and
4) Record responsible points of contacts for each, if known;

After finishing the earlier Topic Area Applicability task, the participants were provided with the Capability Needs and Available Resources worksheet packets and tasked to:

1) Identify and/or backcast their institutionally relevant capability needs and available resources that fall under each relevant environmental security component; and
2) Record these results on form packets provided.

Building on the earlier brainstorming exercise, these workgroups outputs provide an important snapshot of the participants' thoughts and knowledge of the institutionally relevant environmental security issues, capability needs / gaps, and available resources. The combined results from both form packets are presented below in Tables 10-12 by environmental security definitional component. These summaries are by no means comprehensive but do begin to provide a starting point for linking environmental security topic areas / common elements, issues, needs / gaps, and capabilities.

Table 10: DOD / U.S. Army Participant Identified Issues, Capability Gaps, and Available Resources

Public safety from environmental dangers caused by natural or human processes (due to ignorance, accident, mismanagement, or design)			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Contamination from Army Activities	*Army Environmental Community (AEC, etc.)*	*Expertise & programs exist*	*Budget requests exceed allocations*
See Response to Natural & Manmade Disaster	*National Guard, Corps of Engineers, & HQ Guard*	*Programs & cooperation exist*	*Each incident is unique & need automation to save steps*
Response to environmental damage as an act of aggression / war	*USACE, CHPPM, Regular Army, & Contractors*	*Some programs exist*	*Data gaps, manage unknown risks, DSB, & other studies highlight new risks*
Natural resource scarcity			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Resource shortfalls for weapons, platforms, & munitions	*AMC*	*Risk assessment need to be done*	
Domestic installations resource needs (& shortfalls)	*ACSIM, IMCOM, & USACE*	*Starting to evaluate*	*Need better forecasting tools*
Foreign installations resource needs (i.e., temporary bases)	*IMCOM, CO-COMS, & USACE*	*Starting to evaluate*	*Need better forecasting tools*
Resource shortfalls as destabilizing factors	*CO-COMs & Army support to [foreign] States*	*Evaluate how shortfalls impact capabilities & mission*	*State assessments (War College, West Point) but not broad or institutional*

Table 10: DOD / U.S. Army Participant Identified Issues, Capability Gaps, and Available Resources (Cont.)

Maintenance of a healthy environment			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Soldier Health	*MEDCOMs & Units*	*MEDCOM has new programs*	*Exposure to conflict environment still troublesome*
Bioterrorism	*CHPPM (MEDCOM), Chemical Corps, & National Guard*	*Anticipate vulnerabilities rapid / effective response*	*Identify pathways, exposure levels, types, to isolate, & protect*
Pandemic	*MEDCOM, National Guard, & USACE*	*Numerous coordinated response with public health*	
Environmental degradation			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Contamination from Army activities (or Army resources)	*AEC, USACE, & CHPPM*		
Contamination or destruction of Army resources (domestic)	*National Guard, UXO (USACE), Local and State Responders, & Army Units*		
Contamination in host nation environment			
Prevention of social disorder and conflict (promotion of social stability)			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Response to natural disaster	*National Guard, Corps of Engineers, & CO-COMs*		
CSE promotion of social stability	*CO-COMs (Army support to Defense), & [foreign] States*		

Table 11: NASA Participant Identified Issues, Capability Gaps, and Available Resources

Public safety from environmental dangers caused by natural or human processes (due to ignorance, accident, mismanagement, or design)			
NASA's part in the National Response Plan (Science support – remote sensing in national disasters)			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Wildfires	*NASA Earth Science & Kennedy Space Center*	*Remote sensing*	*NASA & NOAA satellites*
Natural resource scarcity			
NASA's Mission Directorates (minerals, mineral products, & materials used in manufacture of space exploration equipment)			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Materials scarcity (e.g., Beryllium, Cobalt)	*Chief Engineer & Environmental Management Division (EMD)*	*Information on availability & scarcity*	*Materials flows & risk matrix*
Maintenance of a healthy environment			
NASA's Centers (Environmental Management Offices) compliance in support of NASA's mission			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Air compliance (i.e., GHG emissions)	*EMD & Centers*	*Specific local emission sources*	*NOAA carbon (emission) tracker*
Water Compliance	*EMD & Centers*	*Water footprint & protocols*	*USGS watershed inventories & handbooks*
Land compliance (i.e., solid waste)	*EMD & Centers*		

Table 11: NASA Participant Identified Issues, Capability Gaps, and Available Resources (Cont.)

Environmental degradation			
NASA's Centers (clean-up restore environment in support of NASA's mission)			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Restoration	*EMD & Centers*	*Tech transfer*	*EPA & DOE tech transfer*
Research & development (e.g. restoration technology, nanotech for clean-up, etc.)	*Science Mission Directorates*	*Database & information system*	*DOD, DOE, EPA,& SERDP-ESTCP Program*
Climate change (e.g., ecological impacts on watersheds)	*NASA-GISS*	*Geographical down-scale models (decision-support tools)*	*NASA-GISS methodology & scientists*
Prevention of social disorder and conflict (promotion of social stability)			
NASA's Science Mission Directorate for decision-support tools, and remote sensing			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Climate change (e.g., sea level, storm surge, etc.)	*NASA-GISS*	*Hydraulic models*	*USACE, USGS, & Academia models*
Hurricane (i.e., remote sensing & decision support tools)	*NASA-GISS*	*Better models for prediction for long-term*	*NOAA & Academia (e.g., NCAR) models*

Table 12: Non-Profit / University Participant Identified Issues, Capability Gaps, and Available Resources

Public safety from environmental dangers caused by natural or human processes (due to ignorance, accident, mismanagement, or design)			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Resource distribution and assisting Federal Authorities	*Red Cross / Volunteerism*	*Better interagency coordination*	*Personnel support, contractors, expertise / management & consulting*
Analytical support		*Technology (i.e., warning, response, etc.)*	*Laboratories, computers, analytical support, incentives, & public / private partnerships*
ROTC, graduate training for officers, training programs, Education		*Intelligence (i.e., threat assessment)*	*Research, personnel support, & open source information collection through seminars, etc.*
Conferences and seminars	*Program Managers / Directors*	*Better interagency coordination*	*Personnel support, contractors, & expertise / management consulting*
Natural resource scarcity			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Basic research and research & development for alternatives	*Academic Leaders & Program Managers*	*Identification of emerging trends*	*Analytical support & development of research tools*
Maintenance of a healthy environment			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Public awareness & communications / advocacy	*Think Tanks & CNA*	*Raising public awareness*	*Convening power, inter-disciplinary resources, access to students, & non-partisan affiliation*

Table 12: Non-Profit / University Participant Identified Issues, Capability Gaps, and Available Resources (Cont.)

Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Education and training in health fields	*Universities*	*Interdisciplinary training on public health*	*Academic programs & resources*
Institutional sustainability with facilities	*Energy Managers, Facility Managers, etc.*	*Problem identification / assessment*	*Analytic support & academic training*
Facilitation of dialogue on health issues	*Think Tanks & Universities*	*Promoting efficiency / reducing costs*	*R&D & identification of best practices*
Threat forecasting / preemption	*Think Tanks & Universities*		
Environmental degradation			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Public awareness	*Think Tanks, Universities, & Industry Organizations*	*Increase Public Awareness*	*Convening power, access to students, & non-partisan*
Research & Development RE: Remediation	*Think Tanks & Universities*	*Develop best approaches / practices*	*R&D, survey methods, & academic programs*
Contract / Consulting for Government	*Think Tanks & Universities*		
Prevention of social disorder and conflict (promotion of social stability)			
Identified Issues?	**Relevant Organization(s)?**	**Capability Needs / Gaps?**	**Available Resources / Tools?**
Democracy education and promotion	*NGOs & Universities*	*Intercultural understanding*	*Contacts, facilitations, surveying, & data collection / analysis / compilation*
Cultural exchange, public diplomacy studies, data collection, and surveys	*NGOs, Universities, & Civic Groups*	*Needs assessments*	*Analytical capability & objective perspective*
Needs assessments	*NGOs & Universities*		
Conflict analysis & prevention studies			

Workshop Conclusion:

After finishing the institutional workgroup tasks, the initial workshop methodology had included provisions for brief workgroup outbriefs. However, given the informal, small group setting, there was much interactive discussion throughout the day on the participants' thoughts, consensus, and findings. Given this and time constraints, the participants decided that 5-minute outbriefs would have been redundant and not added significant value for the workshop participants. I closed the workshop by thanking the participants for their contribution of time, effort and invaluable expertise. I also reminded them of the on-going nature of this process and informed them about the intended report back arrangements under Task 5.

Overall, this workshop's outputs not only reaffirmed the survey's initial findings but also generated several significant new insights about the participating institutional communities, which also seem to clearly align with emerging literature and its findings (e.g., "Green Warriors" study). The workshop's results directly addressed this project's research question about the capability needs, resources, and opportunities that exist among the current federal national security stakeholders that contributed to the workshop. The findings presented above and summarized in Tables 10-12 provide a starting point for linking up environmental security topic area / common elements to issues to needs and capabilities. In Chapter 7, these outcomes provide a basis and context to discuss environmental security as a value added proposition and/or force multiplier for U.S. national and homeland security policy, operations, and implementation.

CHAPTER 7: DISCUSSION AND MOVING FORWARD

This thesis project's stated goal is to gain new knowledge on how U.S. national security and homeland security practitioners understand and could yield value from environmental security to meet their mission, policy, and operational challenges. It has indeed generated a snapshot of the perspectives held by some within these larger policymaker and practitioner communities. In this chapter, I briefly discuss the thesis project's overarching findings, their implications within the U.S. policy environment, potential implementation opportunities, and future research efforts.

Findings:

Early on, I recognized several challenges to U.S. policymakers and practitioners from realizing the potential integrative and value added proposition of environmental security. The primary challenges were identified and confirmed as:

- Lack of common and recognized environmental security definition;
- Lack of U.S. national security policy and strategy mandate for environmental security activities, even when developed though operational necessity; and
- Limited understanding of U.S. environmental security players, existing capabilities and need gaps.

My literature review and field research identified and confirmed a spectrum of environmental security definitions.

- Environmentalist plot to conceptually muddy the waters and siphon defense resources (Mansfield 2004)
- "Real-politik" nation-centric security issues and maintenance of defense capabilities (Ohlsson 1999: 27)
- Environmental conflict concept that resource competition and stress augments or triggers conflict (Homer-Dixon 1994, 1999; Gleick 1993; Dalby 2002b).
- Environmental security component of "human security" paradigm (UNDP 1994: 24; Matthew 1999: 14; Floyd 2007b: 341)

This project's aim is to determine what national and homeland security policy-makers and practitioners generally agree on and where there are diverging in their understanding of the environmental security concept. Generally, the survey and workshop responses suggest that the sample of national security practitioners have a wide variety of understanding of environmental security but were familiar with the term. Most respondents' understanding of the concept seemed to fall in between the real-politik nation-state centric view and the human security component perspective focused on individual security.

The projects participants indicated widespread agreement with and consensus on most of the Glenn *et al.* (1998) environmental security common elements, which included:

1) *Public safety from environmental dangers*
2) *Natural resource scarcity*
3) *Maintenance of a healthy environment*
4) *Environmental degradation*

(Glenn *et al.* 1998: 19)

They indicated that these should be included as part of environmental security concept and are institutionally mission relevant. This level of agreement suggests that these environmental security common elements represent basic level commonalities that can conceptually bridge U.S. national security professionals. As such, these components could reasonably be accepted and leveraged to support integrative interagency policy and implementation frameworks.

However, the exception to this reasonably broad consensus is the ***prevention of social disorder and conflict*** common element. While there was still significant support to include this under the environmental security concept, there was particular dissention on its mission relevance across the range of respondents. Of those participants who thought it relevant, several cited new integrative national security mandates such as NSPD-44 and DODD 3000.5, but also noted that these lacked a clear environmental component. The agreement or disagreement on this common component seemed to depend upon the participant's institutional perspective (i.e., defined mission) and/or where they sit conceptually on the environmental security definition spectrum (i.e., real-politik or human security).

Some national security participants also proposed additional common elements of environmental security. These included specific local issues like defense installation encroachment to more geographically and conceptually broad topic components, such as natural hazard / manmade emergency response, energy security, and climate change / climate shock. These proposed items also seemed to fall along the spectrum of real-politik to human security spectrum, with a leaning toward the former.

Participants also identified a strong connection between environmental security and sustainability as well as overwhelmingly considered the two concepts mutually dependent or, at the very least, complementary. They also sometimes framed environmental security as a component of and/or mean to realize sustainability. Defense respondent comments seemed to specifically indicate that sustainability is also considered relevant to their institutional mission responsibilities, particularly where it contributes to supporting mission capabilities and social stability / resiliency approaches. These results all seem to reaffirm the connection or analogy between human security and sustainability concepts. It also begs the question, whether they are two sides of the same coin?

While limited, these participant findings identify some promising common areas that can be part of the conceptual framework for a new U.S. specific environmental security policy. This policy would optimally be an integrated and supporting pillar of the U.S. national security grand strategy (i.e., NSS) to realize the best value to Executive Branch departments' / agencies' mission, policy analysis, and planning frameworks. This would be required because policies at any lower level would likely not provide high enough leadership to directly engage and align mission, planning, and budgeting priorities of various U.S. federal departments and agencies. This level of strategic policy leadership would enable a more coordinated interagency approach and help overcome some of the institutional resistance to interagency implementation activities.

In Chapter 4, I presented a mission functional analysis to help identify potential institutional stakeholders an environmental security policy might have within the U.S. federal family. The resulting lists are a basis to start understanding the scope and

potential implement such an environmental security policy might entail. This rapid analysis identified six U.S. Executive Branch departments that have environment and security mission mandates. By also identifying federal security, environment, and development missions, the stage is now set to better understand the scope of resources, expertise, and coordinated effort that could be leveraged toward defined and complementary national objectives. Considerable synergies could be realized and duplicative capabilities avoided (i.e., more resources to task toward effective coordination and other key mission priorities). A strategic level environmental security policy would also enable the formation of federal workgroups and collaborative team networks solely devoted to addressing high priority, environmental security challenges. After all, according to national security author John Robb (2007), these types of horizontal organizations, structures, and associations are precisely the flexible approaches being successfully used against us by our GWOT adversaries.

While no current environmental security institutional definitions are identified, many of the survey and workshop findings indicated that U.S. defense and civilian agencies already have relevant mission responsibilities and operational considerations. Defense respondents went as far as to cite the environmental security linkages to SSTR, counter-insurgency, engagement, emergency response, and humanitarian aid missions in addition to the standard environmental compliance requirements for the defense establishment. This project's research identified COCOM level activities that were initiated and/or continued because of operational necessity (see Chapter 6) despite the lack of a current U.S. environmental security policy.

Environmental security activities and needs are also being expressed in both domestic and international crisis situations. One workshop contributor strongly suggested that soldiers operating in field already understand how environmental considerations can posed major challenges to their missions. A key real world need is for DOD environmental support providers to understand how to align with and support forward troops' mission needs. The recently released "Green Warriors" study focused on environmental considerations in full-spectrum contingency operations and serves to further reinforce this finding (Mosher *et al.* 2008). This project's results also suggest that current interagency organizational structures, cultures, and resource allocations do not seem adequate to enable the coordinated action necessary support military and civilian field personnel in their environment-security-development activities. These findings track with the environmental gap in existing SSTR coordination policy documents from NSPD-44 to DODD 3000.5 to USAID Civilian-Military Cooperation Policy. In this context, the term "smart power" was also introduced and emphasized several times during the project workshop (AWP 2008).

The project participants provided insights into current environmental security related capability gaps. They identified acute needs for coordination, technology transfer, remote monitoring, physical environment modeling, and forecast capabilities (see Chapter 6). Furthermore, there is a pressing need to understand and correlate needs to emerging energy, climate change, water, and food security drivers within the U.S. national security community. Much of the requisite expertise and research on gaps are open source and resident within external federal civilian agencies, universities, and non-

profit organizations. In the context of climate change, this point was strongly emphasized by the U.S. National Intelligence Council (NIC) Chairmen during his recent July 25th, 2008 testimony to the House Committee on Intelligence and Committee on Energy Independence and Global Warming (Fingar 2008).

In short, the survey and workshop findings indicate that most of the participating national security practitioners believe that the current U.S. environmental security policy mandate is insufficient. As such, these results suggest that a lack of a broad U.S. environmental security policy misses out on the potential for a more integrated mission directive and cohesive framework, which could be a force multiplier at the tactical, operational, and strategic levels. It also begs a similar question of how to provide feedback mechanism to national security policymakers based upon input from those on facing real world challenges and how this can be used to make strategic adjustments and investments. This practical feedback could also be fed into the academic conceptual discourses and contribute to the U.S. policymaking process.

Environmental Security Conceptual and Policy Context:

While this project's study boundaries focus primarily on the U.S. policy and practitioner realm of environmental security, the recent international conceptual works by Dr. Rita Floyd (2007a, 2007b) have helped to crystallize this "object of reference" classification spectrum shift, security's "mobilization power," and focus on end "consequences" of "securitisation" / "desecuritisation" (2007a: 327, 329, 343, 347). Using this analytical lens, Floyd has eloquently elaborated U.S. environmental security (nation-state centric) policy's evolution along this spectrum from the mid-1990s to 2007,

and how its ultimate "desecuritisation" did not realize all of the concept's potential positive value added (Floyd 2007b: 347). To me, this suggests that any future U.S. environmental security policy needs to be more broadly defined (i.e., human security-centric) and endeavor to be more holistically integrated into U.S. national security grand strategy to truly realize the concept's full potential and value added.

As I have been exposed to these scholarly discourses, recent U.S. policy drivers (i.e., NSPD-44, DODD 3000.5), and this project's field research results, it has become clearer that there is a subtle but noticeable shift by U.S. policymakers, thinkers, and practitioners toward a more individual-centered, human security perspective that has also been increasingly accompanied by an incremental reemergence of environmental security, in practice if not name (Beebe 2008b; Pumphrey 2008; DOD 2008). Interestingly, while human security isn't mentioned by name in the 2006 NSS, it integrally underlies and reinforces the stated NSS goals of promoting "freedom, justice, and human dignity" (Read: "freedom from fear" and "want") and doing so in a cooperative and multilateral way (Bush 2006: ii; UNDP 1994: 24).

Nowhere has this strategic U.S. policy shift toward individual human security promotion been more noticeable than in the domestic 2007 NSHS. It was prepared in the aftermath of the failed federal, state, and local response to Hurricane Katrina (HSC 2007). Despite the U.S. Government's considerable emergency response capacity, Hurricane Katrina and Rita generated unprecedented damage, economic devastation and thousands of "environmental refugees" (Beebe 2008b: 1). Not surprisingly, the policy fallout from this catastrophe prompted the 2007 NSHS to include the explicit realization

and assertion that citizens and government at all levels share a coordinated responsibility for individual and national security (HSC 2007).

While still a nation-state centric practice, U.S. national security policy continues to evolve and adapt to real world realities, threats, and opportunities. This study's findings seem to indicate that environmental aspects and topics are increasingly interfacing with the national security spheres. In the absence of a U.S. environmental security policy, necessity has been dictating action, but it is not coordinated, focused, or funded in ways to effectively address the widespread 2nd and 3rd tier environmental challenges to the achievement of U.S. national security objectives. How can future U.S. national security strategy be planned and implemented without including this critical part of the human security puzzle, particularly in light of the hard lessons learned of Katrina, Rita, Southeast Asian Tsunami, Iraq, and Afghanistan?

In last few years, environmental security related issues have been becoming major national security policy discussions to varying extents. Amid tightening petroleum supplies and concerns about peak oil, **energy security** has become a common policy discussion that already has spurred action within the U.S. Government. U.S. Congress has passed legislative mandates such as the Energy Policy Act of 2005 (EPAct 2005) and Energy Independence and Security Act (EISA) of 2007. From the Executive Branch, Executive Order (EO) 13423 was issued in early 2007 and focuses on energy security issues. The Defense Science Board (DSB) Task Force released a detailed DOD Energy Strategy in 2008 that documents the defense community's renewed strategic focus on energy security (DSB 2008).

While linked to energy security issues, **climate change** has seen increased policy discussion and independent public attention, particularly since the release of CNA report titled "National Security And The Threat Of Climate Change" (Catarious *et al.* 2007). The release of this report seemed to open the floodgates and has spurred significant efforts to better understand the implications of climate security and climate shock. Per Sec. 951 of the National Defense Authorization Act for Fiscal Year 2008 (H.R. 1585), DOD is now responsible to analyze, assess, and plan for the implications of climate change (U.S. Congress 2007). The fast and furious pace of climate security has led some national security practitioners to dub 2007 as the "Climate Change Ides of March" (Beebe 2008b: 1).

Other growing areas relevant to a U.S. environmental security policy might include natural / manmade disaster response, water (quantity and quality), food security, and environmental-related forward basing issues. While not as high profile as either energy security or climate change, these environmental security topics all seem to be increasingly critical policy and operational areas with both domestic and foreign policy implications. Yet, practitioners lament the lack of a unifying U.S. policy framework that can help integrate these complex challenges and get them incorporated into the strategic planning, prioritization, and budgeting processes (Beebe 2008b).

However, there are some additional national security developments already starting to spur thoughtful conversations along these lines. First, the DOD's Future Force transformation toward Thomas Barnett's (2005: xvii, xix) "Leviathan" and "SysAdmin" (i.e., SSTR capability) paradigm are already underway (DOD 2005). Second, discussions

about optimizing U.S. and allies force capabilities and mixes along the entire spectrum conflict (Armitage and Moisan 2005). Third, GWOT related military-to-military cooperation and training efforts via Section 1206 authority (GAO 2007). Fourth, GWOT's operational realities are resulting in greater focus on OCONUS SSTR operations, which will increasingly be given equal status with combat operations (i.e., DODD 3000.5) (DOD 2005). Fifth, frontline troops and forward deployed bases are being confronted by significant environmental challenges (Mosher *et al.* 2008). These challenges can be endured or seized as complementary opportunities to achieve mission through civilian- or military-to-military engagement programs. Sixth, the real world lessons and experience from military, civilian, and civil society reconstruction teams in post-conflict environments offer unique opportunity for practical and policy feedback for future efforts. Seventh, the U.S. post-Katrina domestic homeland security emphasis on individual preparedness represents new opportunities for synergies for rethinking community resilience and natural / manmade disaster response. Eighth, the fall 2008 stand up of AFRICOM offers a unique opportunity to integrate environmental security and sustainability principles into their human security oriented planning and activities. Finally, the desire to pursue a national security strategy based upon the concept of "smart power" is highly complemented by the potential opportunities enabled by an U.S. environmental security policy (Adams 2008).

By all indications, this project is extremely timely because of identified need to rethinking the U.S. grand strategy for national security. With an impending change in U.S. Executive Branch leadership, future national security policy can potentially leverage

a broader concept of environmental security to help round out and complement the on-going U.S. shift toward a human security-oriented national security paradigm. In doing so, environmental security will be able to offer many new national security opportunities as a U.S. force multiplier.

Potential Implementation Opportunities:

What potential opportunities might be created by the adoption of a U.S. national environmental security policy? First, a policy mandate could be useful to provide policy legitimacy and leadership for existing environmental security activities, particularly those already developed through mission necessity and shown success. Second, it would also provide an integrative mechanism to coordinate efforts to manage emerging issues, such as energy security, climate change, etc. Third, it could enable a new level of cooperation among the U.S. federal family to achieve integrated "smart power" goals and objectives. Fourth, it could provide a mandate for the coordinated development of preventative capabilities for: 1) environmental intelligence monitoring; 2); engagement, partnering, and development efforts; and 3) disaster resiliency and response mechanisms. Fifth, a policy mandate would be supportive of efforts to better design, plan, and, ultimately, support forward deployed bases, civilian development field efforts, and environmental security engagement activities. Sixth, it would potentially provide a new engagement context and aid with post-conflict and counter-insurgency engagement efforts. Finally, environmental security resource monitoring, disaster response, and engagement venues would be good opportunities to deploy open source capabilities / approaches as advocated by John Robb (2007) and Shannon Beebe (2008). An existing example of this might be

the successful Famine Early Warning System Network (FEWS NET). The same type of collaborative data, technology, ground truthing, and decision-making approaches could be leveraged across defense, diplomatic, and non-profit stakeholders to facilitate more effective collaborative activities across the spectrum of conflict (i.e., peace through war).

If environmental security were incorporated into the new U.S. President's NSS in 2009, there would also be significant a timing opportunity, particularly within the defense community. Once incorporated, it would be integrated into the next revision of DOD's NMS. Likewise the policy and NMS could influence the development of the upcoming 2010 QDR. On the civilian side, a NSS change would also enable environmental security's inclusion into the Department of State's and USAID's next strategic plan as well as those of other civilian agencies.

Regardless of timing, a high-level environmental security policy would also provide the mandate for creating new interagency workgroup and teams. This could build on the proposed "Global Environmental Security Survey Teams (GESST)" concept proposed by Shannon Beebe (2008b: 2). These workgroups and teams could also have U.S. embassy-hosted variants based in partner countries. For example, in the 1990s, USAID had voluntary "Strategic Objective Teams" that included U.S. interagency collaborators, host country participants, and non-profit collaborators (Wright 2000). An environmental security mandate should have provisions to encourage these types of collaborative mechanisms while also supporting planning and implementation activities complementary with U.S. development and sustainability programs. In this way, a broad

environmental security mandate could truly be a U.S. force multiplier and actively catalyze opportunities in the exercise of smart power.

Future Research Efforts:

During the course of this project, I found that there are several areas of new research opportunities related to U.S. environmental security at all levels (i.e., strategic, operational, and tactical) and across the full-spectrum of conflict (i.e., peace, MOOTW, war). While environmental security has benefited from decades of conceptual and case study research, I initially found that there were limited resources on the evolution of U.S. Government-specific environmental security policy and its implementation, but several recent (and in process) publications are starting to address this gap in the literature. There is also some excellent expertise, research, and literature on U.S. environmental security thought within the DOD, particularly at OSD, AEPI, Army War College's Center for Strategic Leadership, U.S. Army Command and General Staff College, USACE, and COCOMs. In addition, the Woodrow Wilson Center's Environmental Change and Security Program (ECSP), The Millennium Project World Federation of UN Associations and various important university and international thought leaders are contributing to this exploding area of study.

Through the course of this project, I identified several timely opportunities for research and further study. First, there is a need to study and expand thought on how to understand environmental security's linkages, utility, and value added across conceptual, policy, regional, and local contexts. Second, it is necessary to systematically collect and

compile information about existing environmental security operational / tactical level activities, project case studies, successes, best practices, and gaps. Third, it would then be possible to compile and analyze the identified needs to develop a more refined U.S. national environmental security policy that builds on what works and start to systematically address the acknowledged challenges. Fourth, there is a need to perform a more in-depth U.S. Government institutional mission, functional, and capabilities analysis (i.e., inventory of national means). These efforts would contribute to the ability to map out more integrated action and capability development plans. Fifth, it is necessary to better understand and develop environmental security indicators and analysis methods in an interdisciplinary manner that includes political, peace, social, economic, environmental, geography, conservation, and sustainability study disciplines. Narrowly focused or traditional stove-piped efforts are not sufficient for such a task. Finally, to complementary ends, there is a pressing need to better understand the connections between environmental security and existing U.S. Government sustainability policies, plans, and activities as well as other relevant areas, such as energy security, climate change, natural resource management, etc. While not exhaustive, there areas of further study would represent important opportunities to address needs I identified through the course of the research and elaborated by project participants. Although it would be ideal to address all of these challenge areas simultaneously, further study in any of them would contribute to the current state of science, knowledge, and utility of this growing, interdisciplinary field.

CHAPTER 8: CONCLUSIONS

GWOT, Operation Iraqi Freedom, Operation Enduring Freedom and the aftermaths of the Southeast Asian Tsunami, Hurricane Katrina and Rita all highlight the many real world environment related security challenges that increasingly face U.S. Government's national security missions and operations into the future. This research effort engaged interested U.S. national and homeland security professionals to better understand their perspectives and explore environmental security's current potential to help them meet their critical mission and operational needs. In doing so, I found that they largely agree on environmental security's common elements despite differing institutional perspectives. The results also preliminarily identified some mission relevant environmentally related security issues, mission and operational capability gaps, and available resources.

By all indications, this project seems to have been timely in its exploration of U.S. environmental security. As the U.S. (and humanity in general) face unprecedented challenges on many fronts, it has been rewarding to research and discuss such a crosscutting and practical concept that has the potential to enhance our Nation's policies and real world capabilities as a positive force in the world. With further targeted study, the concept can help U.S. policymakers and practitioners to continue realizing the potential integrative and value added proposition of this policy approach. In doing so,

environmental security may be able to offer many new national security opportunities as a U.S. force multiplier for good in a world confronted with an unprecedented growth of environmental threat multipliers.

While this concept still has some explicit concept definition and scope risks, the policy legitimacy and interagency opportunities environmental security offers to support existing national security capability planning and partnership building seems like it would be invaluable. It can help the U.S. in its efforts to rebuild long-time alliances and engage new allies through the practical common ground revealed by environmental security and its constituent issues. Concurrently, a new policy component would also facilitate the deployment of environmental resource monitoring capabilities and collaborations that could benefit policymakers, practitioners, communities and, ultimately, individual families' well-being.

Foreign Service, development professionals, and soldiers are all the everyday heroes of the different communities they work in and for. Based upon my experience and this research project, it seems that these seemingly diverse individuals are growing closer in the aims (i.e., human security) and increasingly the means (i.e., environmental engagement). While more is asked of citizens, scientists, first responders, and soldiers, don't these real world practitioners deserve an integrative policy component to help do the work that necessity demands and that can be flexibly supportive for coordination and implementation at multiple scales (i.e., policy/strategic, implementation/operational, and local/tactical) to counter (and preempt) environmental security risks both foreign and domestic. With an impending change in U.S. Executive Branch leadership, future

national security policy can potentially leverage a broader environmental security concept to help round out and complement the on-going U.S. shift toward enduring individual human security goals and systematic sustainable development aspirations of humanity.

APPENDIX A: CONSULTANT REPORT BACK COMMENTS

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As of November 16th, 2008, no project participants had responded with comments on the draft thesis report. If comments are submitted after this date, they will be logged and used to inform future publications and research in this area.

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CURRICULUM VITAE

Jeremey M. Alcorn graduated from Southmoreland Senior High School, Alverton, Pennsylvania, in 1995. Later, he earned his Bachelor of Science from Allegheny College in Environmental Science and Political Science with an emphasis on Marine Sciences in 1999. During that course of study, he graduated as a Cum Laude with Honors and studied at both the Duke University, Nicholas School of the Environment and the Bermuda Biological Station for Research. From 1999-2002, Mr. Alcorn worked as a U.S. Peace Corps Volunteer in Central and Eastern Europe within the local and international sustainability, water protection, and waste management fields. Starting in 2003, he was an environmental scientist at Science Applications International Corporation (SAIC) where he performed technical and policy research, environmental management analysis, and technology transfer support in the areas such as: federal agency sustainability, greenhouse gas inventories, institutional risk management, pollution prevention and water security. Since late-2008, he has expanded this hands-on federal sector support as a Senior Environmental Engineer with Concurrent Technologies Corporation (CTC). Mr. Alcorn has participated in numerous conferences and has authored publications on community and international public participation, practical sustainability indicators, the risk assessment paradigm for critical infrastructure, and implications of climate change on U.S. access to space.