Guidebook on Development and Implementation Of Environmental Education and Training in the Military

A Joint United States – Republic of South Africa Environmental Security Working Group Project

CONSERVAMUS

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

Other Consultants:

COL Seakle K.B. Godschalk, Senior Staff Officer, Environmental Services, Directorate Facilities, RSA DoD.

COL Louise M. Rossouw, Senior Staff Officer, Higher Order Education Training Development, Directorate Logistics, Resource Management, RSA DoD.

Mr. William R. Nicholls, Deputy Director, Office of the Deputy Under Secretary of Defense, Installations and Environment (Safety and Occupational Health), US DoD.

Ms. Susan Clark-Sestak, Research Staff Analyst, Institute for Defense Analyses, US.

Ms. Anna Wallace, Environmental Analyst, Logistics Management Institute, US.

Preface

The relationship between the United States of America (US) and the Republic of South Africa (RSA), which has taken shape under the US – RSA Bi-National Commission, is a critical one to both countries. The cooperative alliance that we have forged in recent years has deepened our mutual understanding and serves as a model for other nations.

Over several decades, we have repeatedly witnessed confirmation of the basic premise that bilateral and multilateral cooperation on topics of mutual concern and interest reap great rewards, including saving time, money and resources as well as learning from the past experiences of others. This has proven to be especially true in the area of international defense-related environmental cooperation. While still a relatively new bilateral relationship, the environmental security initiatives between the US Department of Defense and the RSA Department of Defence have already created a number of specific products. This guidebook is only one of the most recent products.

There is global recognition that world dynamics are creating new environmental challenges and requirements for military organizations worldwide. At the same time, military mission readiness must not be impaired; defense organizations must be able to train their troops and sustain their installations in an environmentally sound manner.

This guidebook is intended to assist the international military community in addressing its environmental education and training needs. Environmental stewardship and integration of environmental considerations into day-to-day operations enhances the military organizations' ability to sustain their missions in an environmentally sound manner. This guidebook is written in a manner that can be utilized by any defense department organization, and will serve to assist them in achieving their overall environmental goals and objectives.

Mr. Curtis M. Bowling
United States Co-Chair

Col Seakle K.B. Godschalk
South Africa Co-Chair

Environmental Security Working Group
United States – South Africa Defense Committee

Acknowledgements and Authors

This Guidebook was developed via a cooperative effort among representatives of the US and RSA via a specialized project team comprised of subject matter experts with experience in both the training development and environmental management arenas. The following individuals provided significant contributions to the development and completion of this Guidebook.

US Team Members:

Ms. Jennifer Leonard – US Project Leader, Environmental Program Manager for Headquarters, Department of the Army, (OACSIM/ODEP), Pentagon, Washington, DC. Ms. Leonard has worked environmental program issues within the Army for over 20 years. Her primary areas of expertise include environmental compliance management, auditing, environmental impact analysis and international environmental cooperation efforts.

Mr. James Flores, Environmental Doctrine Writer/Developer, Army Engineer School, Fort Leonard Wood, Missouri, US. Mr. Flores has over 8 years experience in developing and writing environmental doctrine for integration into military environmental education and training programs within the US Army/DOD.

MAJ Michael G. Osterhoudt, Chief of Environmental Doctrine Division, Army Engineer School, Fort Leonard Wood, Missouri, USA. MAJ Osterhoudt is a combat engineer; his responsibilities at the Engineer School included oversight of integrating environmental considerations into joint/DoD doctrine.

RSA Team Members:

LTC Etienne van Blerk, RSA Project Leader, Staff Officer for Environmental Coordination, RSA Department of Defence, Joint Support Division, Chief of Logistics – Director Facilities, Pretoria, South Africa. LTC van Blerk has over 20 years of combined experience in conservation and environmental management, 10 years of which have been within the RSA DoD. He is responsible for the development and strategic coordination of military environmental issues within the RSA and foreign military organizations.

MAJ W. B. (Kriek) Oelofse, Instructional Systems Designer, South African National Defence Force College for Educational Technology. MAJ Kriek is responsible for assisting in the development of educational training and development programs within the RSA DoD.

CPT Leonie Baird, Specialist Environmental Services, Staff Officer, Director for Facilities Management Support, DoD Logistics Support Formation. CPT Baird has over 11 years of experience in environmental management and environmental education within the RSA DoD.

MAJ Jacques le Roux, Instructional Systems Designer, South African National Defence College for Educational Technology. MAJ le Roux is responsible for the development and implementation of educational training and development programs within the RSA DoD.

Ms. Ina van Rensburg, Logistics Curricular Designer, Directorate Logistics, Resource Management, RSA DoD. Ms. van Rensburg is an academic curriculum designer, with military and civilian experience related to the RSA DoD.

References

Numerous environmental policy and doctrine documents of both the US and RSA Defense Departments were utilized during the development of this guidebook. While they are too numerous to cite herein, it is important to note that key documents used as references during this effort include (but are not limited to):

AR 200-1 – US Army Regulation on Environmental Protection and Enhancement

First Edition – Environmental Implementation Plan for Defence, Government Notice No. 249 in Government Gazette 22022 of 16 Feb 2001

FM 3-100.4 – US Army Field Manual for Environmental Considerations in Military Operations

ISO 14001 - Environmental Management Systems – Specification with Guidance for Use

ISO 14004 – Environmental Management Systems – General Guidelines on Principles, Systems and Supporting Techniques

National Environmental Management Act No. 107 of 1998 (of the RSA)

Table of Contents

Executive Summary

The focus on environmental issues is global in nature, and the integration of environmental considerations into military operations is a growing challenge worldwide. The United States of America (US) and Republic of South Africa (RSA) have forged a cooperative alliance on defense-related issues of mutual concern. Within the US-RSA Defense Committee (DEFCOM), an Environmental Security Working Group (ESWG) has been in place since 1997. Under the ESWG, bilateral initiatives are identified, with joint US-RSA teams established to develop and complete specific projects. This particular "Guidebook" was identified as a topic beneficial to contemporary integrated environmental management processes within the military.

The purpose of this guidebook is to facilitate and assist the international military community in the development and implementation of environmental education and training programs within defense organizations worldwide. While military organizations across the globe may differ in their organizational structures and implementation strategies, environmental stewardship is a common value and shared interest among many nations. Thus, it is essential to integrate an environmental ethic into military operations at all levels, and to ensure that such organizations are aware of the fundamental environmental education and training strategies to assist them in their environmental stewardship goals and objectives. This guidebook is designed to be general in nature, so that military organizations will have a basic understanding of the need to establish "corporate" (i.e. strategic) level environmental policies and principles. It provides information on how to integrate environmental requirements into military education and training programs, so that environmental considerations become an integral part of the decision-making processes at all levels.

All military organizations face environmental challenges as part of their day-to-day operations. This guidebook provides a "template" that can be used by military organizations in developing and/or tailoring their own environmental education and training needs and programs. The guidebook first addresses the need to establish corporate and strategic level environmental policies and principles, and then discusses the environmental training development "process." This "process" constitutes the heart of this guidebook. It discusses the need for weaving the environmental ethic into all levels of the organization. Most importantly, it prescribes an eight-step process to develop the appropriate environmental training and considers the different "target audiences" (from the corporate/headquarters level, to commanders, supervisors/middle managers, down to the basic soldier or unit in the field).

Military commanders, as well as soldiers and civilians at all levels, are ultimately responsible for the lands entrusted to their care. The environmental ethic that defense organizations instill within their own territories must be carried over into operational deployments that extend to areas beyond their control. The concepts of interoperability among different nations and principles associated with proper environmental stewardship are relevant to increased environmental stewardship on a global scale.

This guidebook was developed via a joint US-RSA project team, comprised of subject matter experts in both environmental management and training development from both countries. A list of team members and a glossary of terms used are provided at the end of the guidebook.

Glossary

Centralized	All training takes place at one central point with learners leave their own geographical location to attend
Commander	Person responsible for overall leadership of a unit or facility.
De-centralized	Training information is disseminated to various geographical locations enabling the learners to have access thereto
EETD	Environmental Educational Training Development
Environmental Aspect	An element of an organization's activities, products or services which can interact with the environment
Environmental Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services
Force Enabler	Any item that enhances the force of the military to complete its mission
Imperatives	The "drivers" that influence the requirements (legislation, etc.)
ISD	Instructional Systems Design
Moderation Process	The process, which ensures that assessment of the outcomes, described in standards and qualifications is fair, reliable and valid
Performance Gap	The shortcoming (deficiency) between current level of knowledge and desired level of knowledge
Performance Outcome	Demonstrated end-products of the learning process
Risk Assessment	A study to determine if significant environmental impacts are expected from a proposed action
SAT	Systems Approach to Training
Supervisor	An administrative officer in charge of a business, government, or operating unit

lect all relevant data to determine what each of their jobs entails, as well as how the work must be done and how it could be improved.

With interviews, questionnaires, and observations, you collect your data and determine where environmental considerations are required within the tasks, skills, and applied competencies for each target group.

- Supervisor level (Hard-Charger and Quickfix):

  What – Know, understand, and support national and unit environmental policy and programs.

  How – Exposure to national environmental policy and the impacts associated with the military operations.

  What – Instill environmental vision within subordinate personnel.

  How – Train all subordinate personnel on national and unit environmental policy and programs and enforce them.

- Soldier level (Not-so-Bright):

  What – Maintain proper environmental attitude and awareness while performing all job tasks.

  How – Transfer and dispose of hazardous waste and hazardous material while preparing a waste oil tanker for service in accordance with the unit's standard operating procedures and environmental policy.

Step 5: Course Design

After discussing your findings with Commander Cold-Sweat, he agrees with your recommendation to design and develop two specific environmental courses, described below.

- **A Supervisor Environmental Training Course** has the training objective of identifying policies and procedures to enforce unit compliance with national and local environmental laws and regulations.
- **A Hazardous Waste and Hazardous Material Training Course** has the training objectives of:
  - Identifying hazardous waste and materials
  - Transferring hazardous waste and materials in an environmentally sound manner
  - Storing hazardous waste and materials in an environmentally sound manner
  - Disposing of hazardous waste and materials in an environmentally sound manner.

Step 6 through Step 8

Now that course objectives and outcomes have been identified, which is the most crucial part of the environmental training process, you will need to follow the remaining steps of the process—course development (step 6), implementation (step 7), and evaluation (step 8), as outlined in the section titled, Developing the Appropriate Training and Implementation Strategy of this Guidebook (steps 6-8). These remaining steps of the process are generic to all training programs.

Background

The United States of America (US) and Republic of South Africa (RSA) have forged a cooperative alliance on defense-related issues of mutual concern under the bilateral Defense Committee (DEFCOM). DEFCOM was established in July 1997, and reaffirmed in April 2001, in view of its necessity and value; it remains an active component of the US Department of Defense's environmental outreach program. The Environmental Security Working Group (ESWG) was established in December 1997 to address strategic environmental considerations and was incorporated into the DEFCOM structure. The ESWG is co-chaired by the RSA and DOD senior environmental leadership executives and convenes annually. Bilateral project initiatives are identified, and joint project teams are established based upon the required subject matter expertise, with project teams convening in either of the two countries to develop and complete their efforts. Both countries identified this particular "Guidebook" effort as a topic beneficial to contemporary integrated environmental management in the military. The objective of this guidebook is to facilitate cooperative information exchanges among the international military community on the development and implementation of environmental education and training programs within defense organizations and structures worldwide.

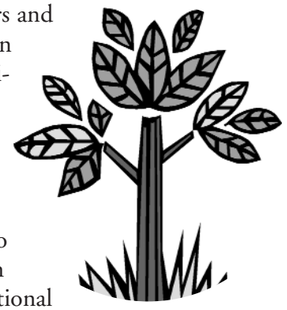
What Is the Environment – What Does It Mean?

The concept of "meanings" encompasses a variety of aspects. Because the environment can have different meaning to different people in different geographic regions, it is necessary to start any environmental education and training program by defining the concept of environment. In general, the environment can be defined as the conditions and influences under which individuals and/or beings (e.g., flora, fauna) develop and live.
These include:

- The natural environment to include renewable and non-renewable natural resources such as air, water, land and all forms of life;
- Physical and biological systems that provide resources necessary to sustain productive human life;
- Manmade structures such as water and wastewater treatment facilities;
- Natural and cultural resources; and
- The social, political, economic and other factors that determine human influence on the environment.

The Environment-Military Connection

Environmental stewardship is a shared value and a common interest among many nations. Thus, it forms a solid basis for furthering broader relationships among countries including within the defense departments and military structures. Because the primary business of defense and military organizations (from both the civilian and military perspective) is centered on readiness preparation in order to ensure effective and efficient deployment of forces as needs arise, environmental considerations must be integrated and woven into the fabric of all military operations and activities. These considerations are to be applied to the entire spectrum of military activities associated with force preparation, force support, force employment, and strategic direction. Given their pivotal role in all operations, military commanders—as well as soldiers and civilian leadership at all levels—must be fully aware of and educated on how to properly integrate environmental considerations into their decision-making processes. This is critical to ensuring that any detrimental effects of their activities on the environment can be avoided or mitigated as necessary.



Commanders, soldiers, and civilians within the various military and defense organizations are ultimately responsible for the lands entrusted to their care. The environmental ethic that defense organizations establish and instill within their own territories must be carried over into operational deployments as well, to include geographical sites and areas that extend beyond their control.

Who Are the Intended Users of This Guidebook?

This guidebook has been developed and written with a broad target audience in mind. It is intended for use by military and civilian personnel at any level that may have responsibility for development and implementation of an environmental program, and to assist them in identifying the appropriate methods to integrate environmental education and training into their mission. It is important to remember the military mission perspective, as well as the need to address and improve environmental literacy and performance; the training element should be employed as the "tool" to integrate all of those perspectives.

Figure 1. Target Audience

This document is designed for use by the broader international military community, as individual countries develop their own needs for environmental education and training. The global tendency toward joint military operations and interoperability becomes a "driver," that is, a motivating factor toward ensuring that environmental education and training are an integral part of the ethos of all military organizations.

Information and data made available by the NESA confirm that an environmental deficiency does exist (contamination in the local river).

Generally, people within your geographical area respect the environment and maintain a decent environmental attitude.

As a result of this analysis, you determine that there is a valid need for the development of environmental training.

Step 2: Training Need Analysis

Upon further investigation through interviews with members of Unit A, you determine that although National Environmental Policy is in place, no environmental vision or policy is accessible or available below the Commander's level at CMR.

Through a questionnaire distributed to members of Unit A, you gather information on the general environmental attitude. You chose to use a questionnaire, rather than additional interviews, to obtain this information partly because you assumed the answers would be more truthful since the respondents would remain anonymous. In analyzing the data, you surmise that the general level of environmental awareness is quite low.

Proper methods for the disposal of potential hazardous waste or hazardous materials do exist, but they are not promoted or enforced at lower levels due to a lack of environmental knowledge and consequent poor environmental attitude and awareness.

You determine that this is a training-related performance deficiency. By comparing the results of your situation analysis and your training needs analysis, you identify that two performance gaps exist on two different organizational levels. The performance gap on the supervisor level is due to insufficient knowledge to ensure the proper implementation of regulations pertaining to the disposal of hazardous waste. The performance gap existing at the soldier level is due to a lack of knowledge about how to properly dispose of hazardous material in a sound environmental manner.

Step 3: Target Group Analysis

You compile information about representatives at each organizational level in order to understand the target group(s). After analyzing the characteristics and unique elements from the commander to the soldier level, you identify two target groups:

- Supervisor Level
- Soldier Level

Keep in mind that this data will become relevant later in course design and development.

Step 4: Task, Skills, and Applied Competency Analysis

Now that you have identified your target groups as the supervisor and soldier levels, you now col-

Several days later, Mr. Cleaner, a member of the National Environmental Stewardship Agency (NESA), visited the commander of CMR, Commander Cold-Sweat, and informed him that oil contamination in the local river, which flows into the town's drinking water reservoir, had been traced back to CMR. Commander Cold-Sweat had recently received a briefing from senior military leadership concerning national environmental legislation, and was well aware of the liability associated with such an environmental violation. On behalf of the NESA, Mr. Cleaner mandated a full investigation be conducted to determine the source and cause of the contamination, as well as a report on what policies, programs, and/or training needed to be developed to ensure that such a violation would not occur again in the future. Commander Cold-Sweat had 30 days to present his findings to the NESA.

Initial Assessment

The scenario indicates that some fundamental environmental stewardship considerations have been violated. The integration of environmental considerations into military mission requirement planning is a necessary cost of doing business. While the Commander of CMR was aware of the consequences of failure to comply with environmental stewardship practices, to what extent were training programs in place to ensure environmental compliance? Among some of the thought-provoking questions to consider are:

- Is this an environmental issue?
- Who would you say is involved?
- In your mind, who is ultimately responsible for this environmental incident?
- Could something be done to avoid a similar event in the future?

Solving environmental training-related problems, and answering the questions above, necessitates the involvement of all organizational and functional levels. This may involve the development of specific environmental training courses for each target group, ranging from the strategic/corporate level to the soldier level. To this end, it would be prudent to make use of the step-by-step process for developing an environmental training course.

Following the Step-by-Step Process

Commander Cold-Sweat has directed you to determine whether this incident was a non-training related performance deficiency or a training-related performance deficiency. If training-related, you are to create a training program that will be used to educate personnel to perform their present jobs to the mandated environmental standards.

Step 1: Situation Analysis

Having received a directive from management, you must first gather an overview of the environmental and training situation that can or could have an impact on the environment or your mission requirements.

You know that National Environmental Legislation does exist and that a general lack of knowledge may exist with regard to the environment and its fragile nature.

This document is NOT intended to represent a comprehensive solution to military environmental education and training doctrine. Rather, it is intended to be a "template" that can be utilized to assist organizations in their approach and strategy to developing and refining environmental training specific to the organization. Figure 1 depicts the intended users and target audiences.

Environmental Principles and Policies

To effectively and efficiently integrate environmental stewardship ethics at all levels within the military organization, it is essential to identify and establish fundamental management concepts and implementing policies. The actual development and execution of environmental programs must include the means to address the parameters (i.e., requirements) of differing levels of environmental legislation, as well as the norms, values and standards fostered by civil society. Additionally, international agreements and conventions must be respected. Emphasis on environmental stewardship and proper management demands integration of environmental considerations into all military planning and activities that could have an impact on the environment. Thus, military organizations must establish a leadership commitment and strategy for meeting present and future environmental goals and objectives. During early development of any military organization's environmental policy framework, key principles should include, but not be limited to:

- ***Compliance*** with all environmental laws as a top priority;
- ***Pollution prevention*** efforts to reduce or eliminate pollution at the source;
- ***Conservation*** of natural and cultural resources for present and future generations;
- ***Restoration*** of contaminated sites;
- ***Protection of the environment*** at all levels via appropriate ***training and motivation;***
- ***Efficient use of resources*** as a "force enabler."

The organization's environmental policies and implementing procedures should be designed to enable it to meet both its environmental stewardship vision and its overall mission requirements in an environmentally sound manner. The proliferation of environmental expectations within defense organizations facilitates the capacity building and empowerment necessary to achieve environmental stewardship. The emphasis of environmental education, training, and development within the military organization will foster increased environmental literacy. That environmental literacy thus serves as a catalyst for environmental accountability at all levels. Specifically, environmental accountability should ultimately reside with every member of the military organization or department, whether it is a new recruit, a civil servant, or the commander at the highest level who wields the power to make decisions on the direction of the Defense department in a democratic society.

Given the above principles, it is essential that military organizations establish a clear "corporate" (i.e., strategic or headquarters) level environmental ethic and policy. The corporate environmental policy must be established and officially issued from the highest level within the organization. It must address responsibilities for planning, implementing, checking (auditing or monitoring) and reviewing the overall effectiveness of the organization's environmental management at all levels. It must prescribe both policies and responsibilities, and provide guidelines for achievement. The corporate environmental policy and principles must also form the basic foundation upon which environ-

mental education and training programs are based, with specific training needs and requirements identified at each level (from the corporate level, to commanders, middle managers and supervisors, and ultimately to the soldier at the base or installation level). Military organizations should strive to establish an environmental management (and training) system that facilitates continual improvement in its overall environmental performance.

Identifying and Defining Military Environmental Education and Training Needs

An essential component of an effective environmental education and training program must include identification and explanation of the requirements of applicable environmental laws, regulations, policies or other standards. Those regulations and policies serve as the "drivers" and imperatives to achieve environmental compliance. In order to develop and implement an environmental education and training program, it is first necessary to assess the environmental awareness and training needs for each fundamental and operational level of the organization, from the corporate level to the basic soldier level. This is necessary to ensure that the appropriate knowledge, skills and competencies required by the various levels in the organization are commensurate with the respective roles and responsibilities. The specific environmental knowledge, skills and competencies required can then be integrated into the appropriate training courses and forums.

Target audiences must first be identified at each level in the organization followed by the development and implementation of appropriate environmental training courses. Additionally, the extent of environmental knowledge and performance expectations will vary widely, depending on the functional level within the organization. For example, at the top corporate level, senior leadership—whether military or civilian— must have a general working knowledge of the broad environmental policies and regulations that are applicable within the organization. Commanders (both installation/base and tactical) and middle managers/supervisors would be expected to have a more in-depth knowledge of the actual "implementation" guidelines and/or regulations so that they can ensure that subordinates under their command execute their responsibilities in the prescribed environmentally sound manner. Finally, the soldier or civilian on the ground at the base level must have the specific "task-oriented" skills to conduct his/her functions and responsibilities in compliance with the appropriate regulations and requirements. In general, the environmental knowledge, skills, attitudes and competencies required at different levels are reflected in the following diagram. As Figure 2 illustrates, applied competency requirements *increase* going down the chain of authority, whereas decision-making *decreases* going down the chain of authority.

If, after careful consideration, an evaluation is deemed necessary, either an internal or an external evaluation can be performed. An internal evaluation will focus on the course itself, while an external evaluation will focus on the results of the training.

Thus, the primary purpose of an *internal evaluation* is to determine whether the instructional development effort has accomplished what was intended. Enough data must be collected so that, through time, the instruction can be improved based upon student performance. If a large proportion of students have trouble with the same segment of instruction in the environmental training, there is likely something wrong with the instruction.

An *external evaluation* consists of determining whether the students can do the task for which they were trained. The entire training process is designed to meet this objective. The external evaluation may indicate that the students are receiving more training than needed, or that they need additional training to execute the environmental task. This information must be provided to the course designer.

Once the evaluation is complete and any training deficiencies have been identified, the design process is repeated to correct the deficiency. This does not mean that the entire training program is rebuilt, just the portions which are not training the students to the required environmental standard.

Environmental Training Scenario

Case Study Example

This guidebook has so far explained the process of creating an environmental education and training course in general terms. This section provides a specific example of an environmental problem and the steps necessary to take in order to solve this problem through training and education.

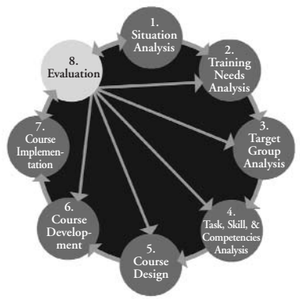
The Scenario

Supervisor Hard-Charger, from Unit Alpha, Central Military Reservation (CMR), informed Soldier Not-so-Bright that his 13,000-liter waste oil storage tanker required its semi-annual maintenance service, and to report to Maintenance Supervisor Quickfix immediately. Supervisor Quickfix informed Soldier Not-so-Bright that his tanker needed to be in service first thing in the morning and that the tanker needed to be empty for service. Soldier Not-so-Bright knew that his tanker was less than half full with waste oil, but that emptying the tanker properly would require him to work after hours. Knowing that he had promised his girlfriend, Ms. Hard-to-Please, dinner that evening, he decided to drain the remaining waste oil into a storm drain behind the maintenance facility.

- **Diagnostic Assessment.** This type of assessment is applied before the learning experience process commences to determine the present performance of a prospective learner.
- **Formative Assessment.** This type of assessment takes place during the learning experience process.
- **Final Assessment.** This type of assessment takes place at the end of a learning experience process.

"Evaluation" determines if the objectives of the training have been met. Evaluation is also a form of quality control since it judges the value and effectiveness of the learning program.

The evaluation phase is ongoing throughout the entire process. That is, it is performed during the analysis, design, development, and implementation phases of the environmental training. It is also performed after the students/trainees return to their workplace. Its purpose is to ***collect and document the results of the learning process*** (i.e., performance, resources, time, etc.). The goal is to fix problems and make the process more effective and efficient.



Evaluation is the process of determining the value and effectiveness of a learning program. The evaluation results provide the data necessary to review the course design process.

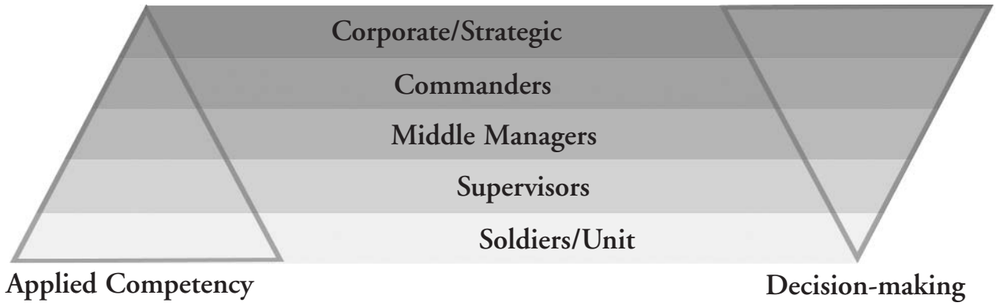
Not every environmental training course needs an evaluation or the same type of evaluation technique. Before beginning an evaluation, several questions need to be answered:

- Should an evaluation be done – is it worth the time and effort?
- What is the purpose of the evaluation?
- What will be measured?
- How comprehensive should the evaluation be?
- Who has the authority and/or responsibility to request or perform the evaluation?
- What is the source of the data and how will the data be collected and compiled?
- How should the data be analyzed and presented?

The types of questions that can be answered by an evaluation include:

- What impact did the training have on the organization's execution of its environmental task(s)?
- Was the return on investment realized?
- Are the trainees using their new techniques and processes back in the work area?
- Did the program change attitudes, behaviors, or skills in a way that positively impacts mission results?

Figure 2. Applied Competency and Decision-making



Applied Competency: Includes the knowledge, skills, values and attitudes necessary to perform specific tasks.
Decision-making: Includes those decision-making skills necessary in the performance of specific tasks.
The applied competency to perform the actual environmental tasks is far more necessary at the soldier/unit level than at the corporate/strategic level. In contrast, the decision-making skills required are far more crucial at the corporate/strategic level, than at the soldier/unit level.

In order to have an effective and integrated military environmental education and training program, it is necessary to identify the different target groups and their respective training needs. ***All echelons*** within the military organization should be apprised of and educated in the core environmental policies and ethics that have been issued at the corporate/strategic level, to include key principles and management concepts (e.g., compliance, pollution prevention). Each level will vary on the amount of training needed. Some levels will require more "policy" and strategically oriented types of training or, environmental training that is "developmental" in nature (e.g., necessary to progress to the next professional or management level within the organization).

Table 1. Environmental Training Relationship Synopsis

Target Group	Types of Training Recommended		
	"Core" Environmental Policies & Ethics	Developmental[1]	Functional[2]
Corporate/ Strategic Levels	R	X	
Commanders	R	X	
Middle Managers/ Supervisors	R	X	X
Soldiers/Civilians (Base level)	R	X	X

R – required training and awareness
X – recommended training
[1] **Developmental Training** – training needed to progress to the next level within the organization or occupational profession (military or civilian).
[2] **Functional Training** – task-oriented training designed to develop the knowledge and skills necessary to perform specific (i.e., operational) functions within an organization. This type of training is focused more on the actual "worker"/soldier level at the base.

It should also be noted that environmental "courses" can be accomplished via various forums, such as class room instruction, videos, self-paced instruction, and practical exercises.

The Overall Environmental Training Development and Implementation Process

When initiating an environmental education and training process, it is imperative to consider the corporate (strategic) level environmental policies, goals and objectives. The scope and boundaries of environmental management that the organization desires to achieve should be clearly identified at all levels. This can also be integrated into the overall fabric of the training development and implementation strategy. Several critical elements should be included to ensure the environmental education and training efforts of the organization are as effective as possible. These include:

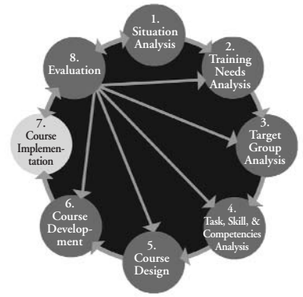
- Environmental Policy - establishing and committing the organization to environmental objectives;
- Planning - fulfilling the organization's environmental policy;
- Implementation - developing the capabilities and mechanisms to execute the environmental policy;
- Measurement and Evaluation - assessing the organization's environmental performance; and
- Review and Improvement - seeking to continually improve environmental management systems and environmental performance.

Developing the Appropriate Training and Implementation Strategy

For centuries, training developers have used either one, or a combination of several, traditional systematic approaches to training such as Instructional System Design, Performance Based Training, The Systems Approach to Training, and Criterion Referenced Instruction for the development of training. The process described in the following pages is designed to help correct specific environmental problems in which the assistance of a subject matter expert in the environmental field is needed.

In recent years, environmental issues have arisen that were not commonly thought about when developing military training. The traditional processes identified above and the process illustrated below will help create a training program that will be used to educate the participants to perform their present jobs to the mandated environmental standard. Figure 3 depicts this step-by-step process for creating an environmental education and training program and shows how each of these steps relates to the others. In the following subsections of this chapter, each of the eight steps is described in detail, including a description of the types of efforts needed to conduct each step. For easy reference, the key concept in each step is highlighted within the subsection in bold/italic typeface.

Step 7. Implementation



Upon completion of the course development, it is best to ***conduct a Pilot Test in which representatives from all the stakeholder groups participate*** (training instructors/facilitators, training management, staff, faculty, and cadre). The pilot course is used to determine strong and weak points and/or gaps such as administrative glitches, content relevancy problems or shortcomings, assessment procedure, training resources, and training strategy. These results should be clearly formatted in a report, that is incorporated back into the course design and course development steps. It is recommended that these refinements be applied before the actual implementation of the course.

Once the feedback from the pilot test has been integrated, the course is ready to be implemented. The following activities are necessary in the implementation step:

- Schedule the training program according to the environmental requirement
- Distribute the training materiel (provide the materiel in advance to the trainees if pre-study is required)
- Train the target group
- Administer the tests and exercises
  - Assess the target group's performance before, during, and after the learning process
  - Offer remedial activities where necessary
  - Establish appeal procedures in the event of poor performance
- Counsel or mentor where necessary
- Review the training (evaluate)
- Maintain course administration
  - Keep a student/trainee record database
  - Student profile
  - Portfolio of evidence
  - Issue certificates of satisfactory course completion

Step 8. Evaluation

"Assessment" measures the practical results of the training in the work environment. Assessment is the collecting of evidence of a learner's work in order to determine if such a learner is competent or not yet competent. The assessment of the achievement (or non-achievement) of outcomes and competencies is measured according to assessment criteria as stated in a standard. To determine if a learner is competent (or not yet competent) the following assessment types are used:

- Determines the optimum training strategy for each learning task so that the trainee may reach the desired outcome (this would include knowledge, skills, values and attitudes).
- Ensures the overall efficiency and effectiveness of the total training program. The results of the pilot test (a self-test used in the implementation phase) will normally be incorporated back into the course design step.
- Takes into account all resource requirements as derived from the situation analysis since this would impact on the training approach and, in turn, impact on the actual learning event.

Course design establishes:

- How (the media and training strategies), when, and where (centralized or decentralized) environmental training will be conducted.
- Training structure (courses, steps, practical lessons, hands-on demonstrations, videos, etc.).
- Required and approved training sequence.
- Assessment method, tools and techniques according to the learning outcome.
- Graduation requirements, i.e., whether the trainee is judged to be competent to execute the environmental task or whether he/she requires additional training.

Step 6. Course Development

During the course development phase, ***the course design output is expanded and developed into learner manuals and learner study guides to be used in the environmental education event.***

The following steps are the most logical sequence for course development:

- Write the training materiel (lesson plans, learning event plan)
- Validate or approve the training materiel/curricula, including tests
- Produce training media
- Prepare material for reproduction
- Acquire training resources
- Prepare facilities and equipment

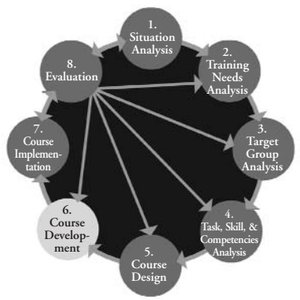
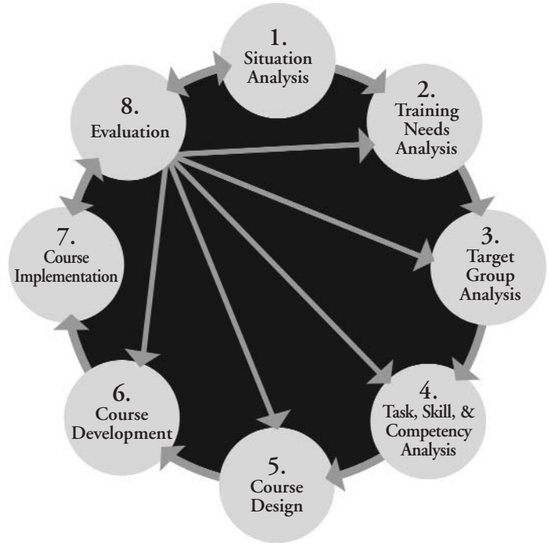
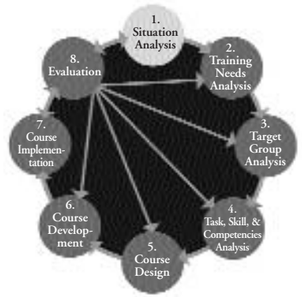


Figure 3. Process Flow Diagram



Step 1. Situation Analysis

A situation analysis is the first phase in the design of a training program. It is a formal process for the ***identification of gaps between the current performance requirements versus the expected performance requirements.*** The situation analysis emphasizes the situation-specific need and indicates the environment in which the needs emerge. The situation analysis is complete only after all results have been analyzed and these results indicate either certain training needs or managerial problems.



A situation analysis can assist you in gathering a broad overview of the environmental and training situation that could have an impact on the environment or your mission requirements. Changes in legislation, as well as reactions to an environmental impact, may require the development of a new aspect of environmental management or environmental training program.

Commanders/managers sometimes unknowingly request training programs for non-training-related performance deficiencies. Non-training solutions may include changes in equipment, supervision, work environment, or motivation.

A training-related performance deficiency may surface from one or more of the following situations.

A directive from management (i.e., to develop/implement a new environmental policy).

In this instance, the purpose of the situation analysis will be to determine how viable the proposed changes or improvements will be. It will also be used to determine how large the training input should be before, during, and after such a change or improvement.

Indicators that "something is not quite right."

The following are some examples of "need indicators" that will call for a situation analysis to be conducted:

- Low morale and unhappiness amongst employees.
- Qualitative and quantitative environmental standards that are not being met.
- Low productivity.
- High injury rates.

An innovative idea.

An environmental improvement idea can be generated as the result of the execution of daily routine or one that surfaces during a routine investigation.

In order to identify training-related performance deficiencies, the situation analysis must address the following:

- Determine what has changed ("change factors"):
  - Compliance with environmental laws and regulations is now a necessary cost of doing business. Factors that influence the integration of environmental considerations into military actions may include, but are not limited to: new or revised laws, regulations, policies and/or other requirements, as well as international treaties or agreements.
  - The sustainability of environmental resources, such as clean air, water, soil, natural and cultural resources, or threatened and endangered species and their habitats, is a necessity to insure quality of life, as well as accomplishing mission requirements. Factors that could influence the sustainability of such resources include, but are not limited to: natural disasters, regional conflict, military operations planned in the absence of an environmental risk assessment, and a lack of knowledge about the environment and its fragile nature.
- Obtain current environmental data and existing environmental standards:
  - An initial environmental self-assessment is another accepted method used for gathering a broad overview of the environmental aspects which exist within the organization, and how they should be managed.
  - Environmental audits can identify potential environmental risks and can help determine solutions with respect to a specific environmental aspect.
  - An analysis of the entire organization (mission, resources, culture, etc.) in order to gain a complete understanding of the organization, using scientifically founded research methods, will aid in the discovery of environmental related deficiencies.

- **Learning Hierarchy Technique.** A logical relationship between tasks is identified. The task is divided into different components in order to determine the correct learning order.

From the preceding techniques, the HOW (learning content) can now be determined by identifying which knowledge, skills, and attitudes the trainee needs in order to be able to master the WHAT (task(s)).

- **Knowledge** - What the worker must know to be able to execute the task successfully;
- **Skills** - What the worker must do to execute the task successfully;
- **Attitudes** - The attitude of the worker towards the execution of the task.

Data Analysis

The final stage in Step 4 is to analyze all the data that has been accumulated, notably data gathered in these first four steps: on the situation, training needs, target group, the task, and applied skills and competencies. This data will form the framework needed to design and develop the course. The following important steps need to be taken:

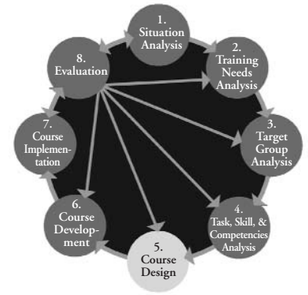
- List the environmental training needs, i.e., performance gap.
- Prioritize the environmental training-related problems.
- Report the training problems, based on the above, to all interested parties and decision-makers.

  Note: Training problems that are directly related to a performance gap due to the employee not being able to perform his/her task competently (because of a lack of skills, knowledge and/or attitudes) can be solved by a training intervention.

Step 5. Course Design

Course design ***determines when, where, and how the training takes place.*** It also identifies training resource requirements. Careful research should be done before the course is designed. This will help to identify other environmental courses that are already available within the organization or identify courses that can be modified to satisfy training needs. If an external organization can fulfill the training needs, the organization should be registered and accredited with applicable education approval authority. Should this avenue be pursued, the quality assurance responsibility still remains with the requesting organization.

Course design translates data obtained from the situation, training needs, target group, task, skills and applied competency analysis into sequential, progressive training courses and programs.



Course design:

- Translates each individual task, skill and value into learning objectives and outcomes.

Job Task Data Collection

Job task data collection techniques determine WHAT the trainee must do, i.e., the environmental tasks that the individual must be able to perform. The ensuing techniques may be used to determine what a task entails:

- **Interview Technique.** A description of the task is obtained by means of interviewing the member in the work situation.
- **Task-Matrix Technique.** The actions of the worker are arranged in such a way that the various tasks can easily be identified.
- **Job-Function Technique.** The task is divided into standardized categories in order to identify and organize such tasks.
- **Risk-Evaluation Technique.** Tasks have already been identified, but the importance and degree of difficulty must be determined.

When the list of tasks has been identified, it is important to determine HOW the tasks must be performed. The following are examples of techniques to determine HOW tasks should be performed:

- **Basic Task-Analysis Technique.** Information obtained includes the steps or elements, equipment and standards associated with a task.
- **Process-and-Chart Technique.** This lists and categorizes the steps in a task and identifies sequence and relationships among them.
- **Operation Chart Technique.** This identifies actions and motions associated with a task.
- **Flow Chart Technique.** This simplifies sequences of actions and decisions in complex processes.
- **Picture Technique.** The sequence of tasks can be illustrated graphically for purposes of analysis through a picture or photograph.
- **Decision-Making Technique.** This process can be successfully used for task diagnostic purposes.

In addition to the task content, it is also important to assess performance criteria; performance "should" occur with the actual performance output. To assess the existing level of task performance compared with the optimal standard of performance one of two techniques can be used: a basic comparison technique or a path-analysis technique.

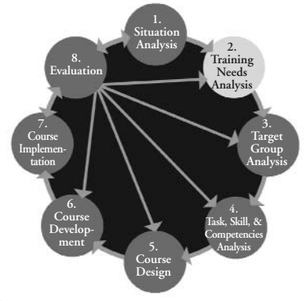
The last step is to determine the training requirements needed for a specific environmental task as well as the skills and knowledge needed to perform the task. The following are techniques that can be used:

- **Learning Objective Technique.** Knowledge and skills required to perform the tasks are identified, as well as the associated standards and circumstances.
- **Learning Strategy Technique.** The learning result is identified; the learning strategy must suit the learning input.

- Identify specific aspects of the organization:
  - Mission/Vision/Goals and Objectives
    - Obtain the organization's mission/vision/goals and objectives in order to determine its impact on, and/or relevancy to the environment.
  - Resources
    - Financial – strengths/constraints that can have an influence in developing and presenting the course.
    - Logistical – infrastructure, equipment, geographical location of where the training is to take place, etc.
    - Personnel – availability of personnel to train the learners.
    - Knowledge level/expertise – the knowledge level of the personnel being taught.
- Describe the culture of the organization:
  - Assess the environmental attitude and values

Step 2. Training Needs Analysis

The result of the situation analysis will be used to determine the training requirement. The needs analysis ***identifies valid training solutions for the unit as well as individual task performance deficiencies, valid training development requirements or recommendations for non-training solutions to address the performance deficiency***. A training development requirement is established if the needs analysis identifies a solution that justifies producing or revising environmental training or training products.



As noted in Step 1, commanders/managers sometimes unknowingly request training programs for non-training related operational or performance deficiencies. Non-training solutions may include changes in equipment, supervision, work environment, salary raises, and motivation.

The training needs analysis provides any one or combination of:

- Environmental training solutions to address the performance deficiency(ies).
- Recommendation(s) for non-training solutions to address the performance deficiency(ies).
- The requirement to improve environmental training efficiency and effectiveness.
- Environmental training development requirement(s).

The training needs analysis starts with:

- **Determining if training is needed.** Analysis of the performance data should assist you in specifying precisely the actual performance deficiency in measurable, observable terms. This analysis will aid in identifying the cause of the identified performance deficiency(ies). In other words, it will assess how and why the environmental issue is not being handled properly and whether training can solve the problem. As mentioned above, a non-training solution may also be identified.
- **Identifying relative criteria.** Relative criteria are usually measured against norms, working standards, and performance levels pertaining to the environmental aspects.

To obtain the above-mentioned information, interviews involving personal discussion(s) with one or more respondents can be used. In addition, the following techniques can be used in order to determine the required performance level/outcome:

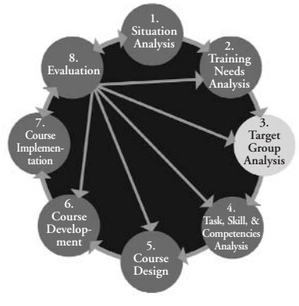
- Questionnaires obtain information by means of a purposeful, structured set of questions. They are usually used to obtain written views of a large number of respondents.
- Brainstorming uses the knowledge and creativity of a number of people to help solve a problem. It is a technique to be utilized within a short space of time.
- Observation allows a person literally to observe how a task is executed. It incorporates looking, listening and reporting on what has been observed.

After obtaining the relevant data by using the above-mentioned techniques and comparing it with the results of the situation analysis, the performance gap can now be established. This can be described as follows:

(Situation Analysis Results) – (Training Needs Analysis Results) = PERFORMANCE GAP

Step 3. Target Group Analysis

In the development of a training course, the target group analysis ***assesses information about the person or group of people for whom the course is to be designed.*** Environmental training must address the specific need of the individual and/or group at the respective level of responsibility.



The analysis represents the summary of the target group's characteristics and unique elements. The characteristics that will have a probable influence on the outcome of the investigation should be considered to ensure the accuracy of the analysis.

Identifying the performance gap determines the environmental training required and on what organizational level (strategic/corporate, commanders, middle management, supervisors, or soldiers) the training must focus in order to achieve the desired outcome.

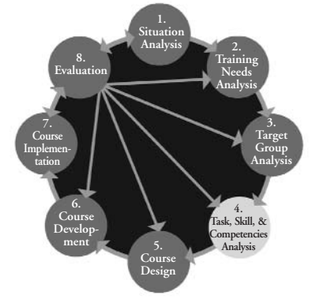
The following target group characteristics and demographics can be used as guidelines to obtain information for each organizational level identified. They include:

- Nature of the group
  - Size
  - Norms and dynamics
  - Geography
  - Educational background (military and civilian)
- Qualifications
  - Training (Secondary and Tertiary)
  - Work experience
- Learning styles – the learning preferences of the trainee
- Motivation levels – the enthusiastic disposition of the trainee

The raw data must be statistically processed in order to be of value further on in the process, i.e., the results from the target group data obtained will guide the design and development of the course.

Step 4. Task, Skills, and Applied Competency Analysis

The task, skills, and applied competency analysis will serve as the basis for training outcomes. The purpose of this analysis is ***to determine exactly what the worker does or is supposed to do in order to perform the task successfully.*** The tasks, skills, and competencies for each organizational level (strategic, commanders, middle management, supervisors, and soldiers) must be determined in order to breach the performance gap on the environmental issue and to reach the desired outcome. The following techniques can be used to gather this data:



- Basic data collection
- Job task data collection
- Data analysis

Basic Data Collection

Interviews involve personal discussion(s) with one or more respondents to gather information regarding the actual tasks done by the individual in his/her workplace.

Questionnaires obtain information by means of a purposeful, structured set of questions. They are usually used to obtain written views of a large number of respondents. This technique also has the added advantage of being able to gather sensitive data from respondents who can remain anonymous.

Observation allows a person literally to observe how a task is executed in the workplace. It incorporates looking, listening and reporting on what has been observed.